Dental Digest

Sixty-Seventh Year of Publication
Volume 67 No. 4

UNIVERSITY OF MICHIGAN
DENTISTRY LIBRARY

April 1961

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NATHAN ALLEN SHORE, D.D.S. (Marquette University Dental School, 1939) has published widely on dental subjects including a book, OCCLUSAL EQUILIBRATION AND TEMPOROMANDIBULAR JOINT DYSFUNCTION. Doctor Shore will be remembered for his two-part article, TEMPOROMANDIBULAR JOINT DYSFUNCTION AND PATHOLOGIC OCCLUSION, which appeared in the September and October 1960 issues of DIGEST. His current article is MUSCLE EXERCISE TO PREVENT CLICKING IN THE TEMPOROMANDIBULAR JOINT.

HARVEY GOLD, B.A. (New York University, 1949), D.D.S. (New York University, College of Dentistry, 1953) is engaged in the practice of general dentistry and has published previously. Doctor Gold makes his first appearance in DIGEST this month, presenting A VERTICAL AND CENTRIC TRACING TECHNIQUE.

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PHILLIP M. CHERNOFF, D.D.S. (The Thomas W. Evans Dental Institute, University of Pennsylvania, 1922) will be remembered by DIGEST readers for the many articles he has published on surgical subjects since 1940. Doctor Chernoff's article this month is REMOVAL OF TEETH BY TOOTH DIVISION.

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The magazine is mailed on the fifteenth of the month of issue.

Muscle Exercise to Prevent Clicking in the TEMPOROMANDIBULAR JOINT*

NATHAN ALLEN SHORE, D.D.S., New York

DIGEST

The temporomandibular joints normally operate like the moving parts of any good machine, that is, smoothly and effortlessly. Each joint is made up of an intricate system of muscles, nerves, bone, and fibrous tissues. The components of the temporomandibular joints that are involved in clicking are discussed in this article.

Normal Movements Illustrated

The series of drawings in Figure 1 shows the moving parts of a normal right temporomandibular joint as the jaw completes the motions of opening and closing the mouth:

(1) The interrelationships of the structures of the temporomandibular joint when the mouth is closed are shown in (a). During normal action of the joint, the condyle maintains the same relative position within the central part of the disc (a, Fig. 1).

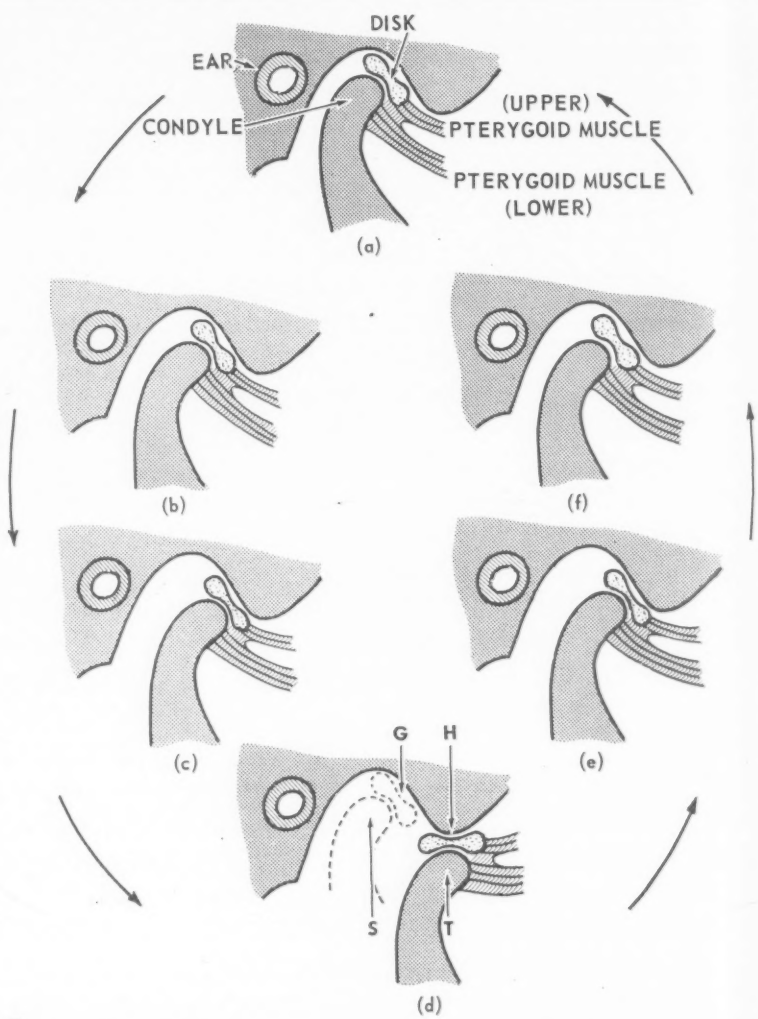
(2) The disc is attached to the upper part of the external pterygoid muscle, and the condyle is attached to the lower part of the *same* muscle.

(3) The intermediate stages before the fully open position shown in (d) is reached are represented by (b) and (c).

(4) The dotted lines (d) represent the original positions of the disc and the condyle, as in (a). The center of the disc has traveled the distance from G to H at the same time as the condyle has traveled the greater distance from S to T.

Different Rates of Speed—Since the movements of the disc and the condyle are controlled by the upper and lower parts of the external pterygoid muscle, this means that the upper and lower parts of this muscle moved at different rates of speed. The lower part of the external pterygoid muscle has to move at a more rapid rate of speed than the upper part so that the condyle and the center of the disc arrive at T and H, respectively, at the same time.

The Problem of Muscular Coordination—Drawings (e) and (f) represent the closing stages before the fully closed position of drawing (a) is attained.



1.
The right temporomandibular joint is shown as the jaw performs the opening and closing phases of movement. (a): relationship of disc and condyle when the mouth is in closed position. (b) and (c): intermediate stages. (d): fully open position; the dotted lines represent the original positions of the disc and condyle as shown in (a). (e) and (f): closing stages.

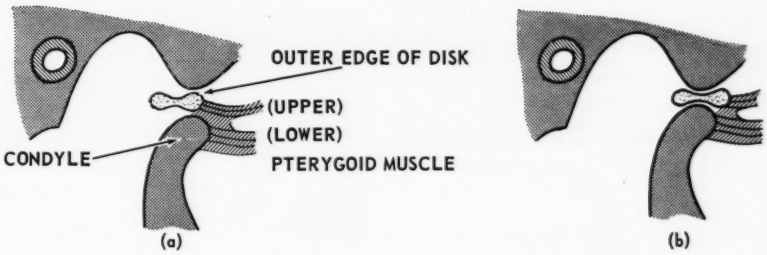
Result of Incoordination of Movements

When the upper and lower parts of the external pterygoid muscle move incoordinately, the condyle does not remain in its normal place in the center of the disc, but rides on the thickened outer edge of the disc, as illustrated in (a) of Figure 2.

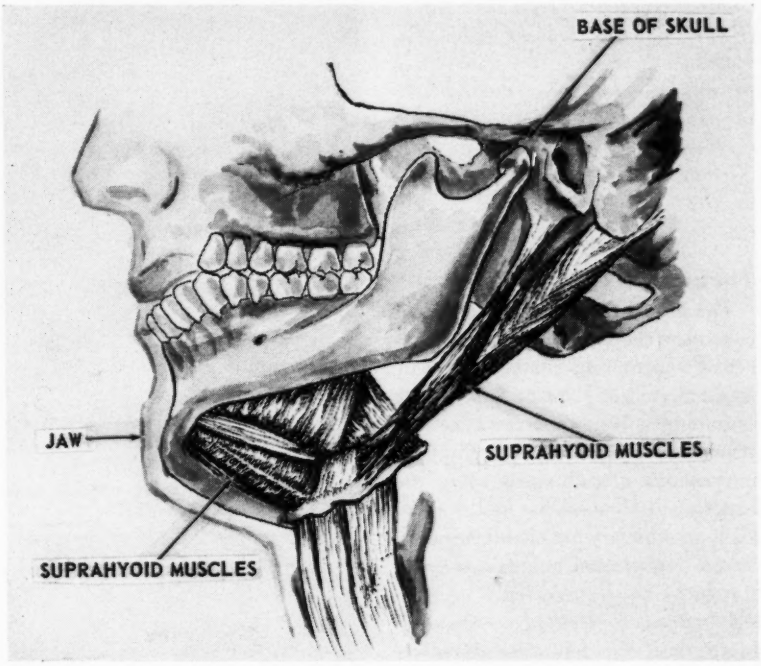
Click Produced — When the jaw opens fully, the disc snaps into place (b, Fig. 2), producing the loud click that is felt and heard.[1,2] If this clicking is allowed to persist, muscle spasm, limitation of motion, and pain often result.

Method Adapted to Retrude Jaw— In order to prevent this lack of neuromuscular coordination between the disc and the condyle, the author has devised a muscle exercise designed to bring into play *an additional set of muscles that aid the improperly functioning joint by retruding the jaw.* The patient soon learns to use this group of muscles (suprahyoid) in opening and closing the mouth.

Relationship Illustrated—Figure 3 shows the relationship between the jaw, the suprahyoid muscles, and the base of the skull. The suprahyoid muscles, as shown in the drawing, are a group of muscles located under the chin. They can be flexed or contracted, in the same manner as the muscles of the arm. When the suprahyoid muscles are flexed (contracted) without any accompanying movement of the jaw, the jaw is pulled back or retruded.



2.
Shows result of lack of coordination between upper and lower parts of external pterygoid muscle. (a): illustrates incorrect position of the condyle on the thickened outer edge of the disc. (b): disc has snapped into place.



3.
Relationship is shown between the jaw, suprahyoid muscles, and the base of the skull.

Exercise to Prevent Click

1. The exercise, which should be practiced in front of a mirror, should be performed with the mouth closed and the teeth touching lightly. In this way, it will not only be possible to feel the contractions of the suprahyoid muscles, but it will also be possible to see the actual contractions of the muscles as observed in the mirror.

2. It is essential not to move the jaw or teeth when doing the exercise. The exercise should be repeated for three minutes every hour.

3. With practice, a definite sense of tautness will be noted in the suprahyoid muscles and in the areas around the temporomandibular joints.

4. Once the first step of the exercise can be performed at will, it is well to practice opening the mouth (just a little to begin with) with the suprahyoid muscles contracted. Day by day, the extent of the mouth opening is gradually increased, always with the jaw retruded.

5. By contracting the suprahyoid muscles, the condyle is kept in its proper place within the central part of the disc (Fig. 1) when the mouth is opened and closed in this restricted fashion.

6. Gradually increase the extent of the opening until the mouth can be opened wide—always with the suprahyoid muscles contracted. Keep practicing this exercise repeatedly; eventually it will become second nature.

654 *Madison Avenue*

*From the Department of Surgery, The New York Hospital-Cornell Medical Center.

[1]Shore, Nathan Allen: Occlusal Equilibration and Temporomandibular Joint Dysfunction, Philadelphia, Lippincott, 1959. pp. 133-136.

[2]Ibid.: pp. 143-145.

A VERTICAL *and* CENTRIC

Tracing Technique

HARVEY GOLD, D.D.S., Albany, New York

DIGEST

A basic premise in full denture construction is that correct centric relation exists only at the proper vertical dimension. Gothic arch tracing devices have provided centric relation with little or no allowance for vertical dimension. The technique described here, referred to as Vertiscriber, results in both correct vertical dimension and centric relation.

Technique

The first three visits of the patient require no change in the dentist's manner of constructing full dentures: (1) At the first visit, primary impressions are obtained from which trays are constructed. (2) At the second visit, final impressions are obtained using the material of choice. (3) At the third visit, an arbitrary but closely accurate centric registration is obtained using wax bite-rims, if preferred.

Vertiscriber Method — On the fourth visit the following essentials provided by the laboratory should be in readiness:

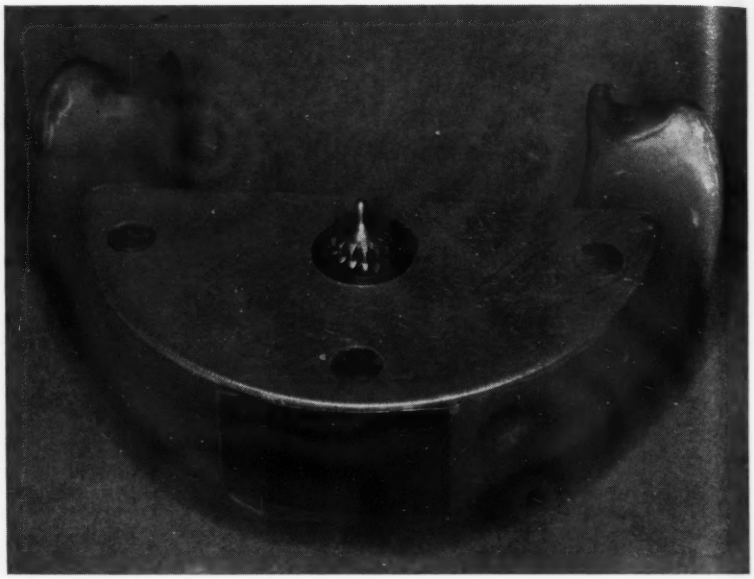
1) An upper bite-rim which houses the centric tracing plate on the palate and the vertical spring and housing.

2) A lower bite-rim which contains a removable centric jack and anteriorly, a vertical tracing plate (Fig. 1). Both rims are stabilized and tried in the mouth.

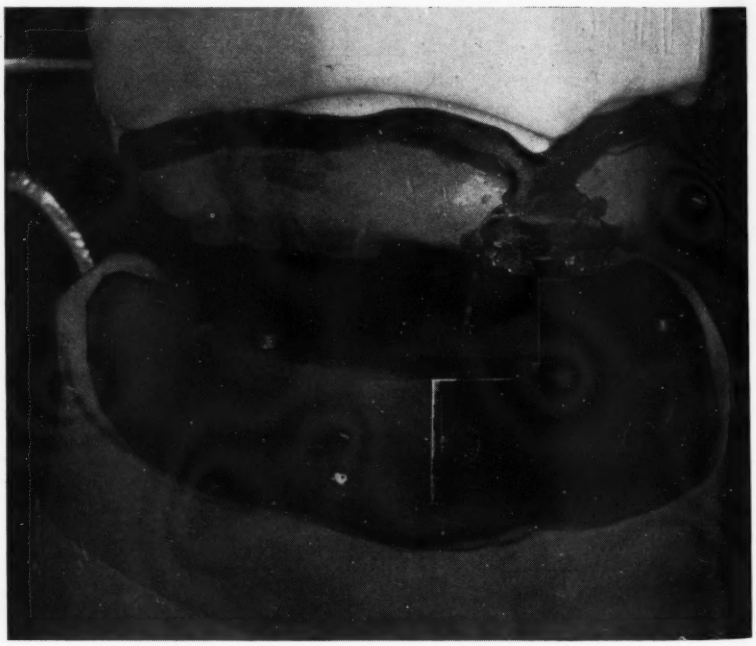
Vertical Dimension Obtained—The following steps are taken:

1. The centric jack is removed from the lower rim and the vertical spring is placed in its housing.

2. Several drops of water are placed in the patient's mouth and he is asked to swallow and open. The words "bite" or "close" are not used for fear of overclosure.

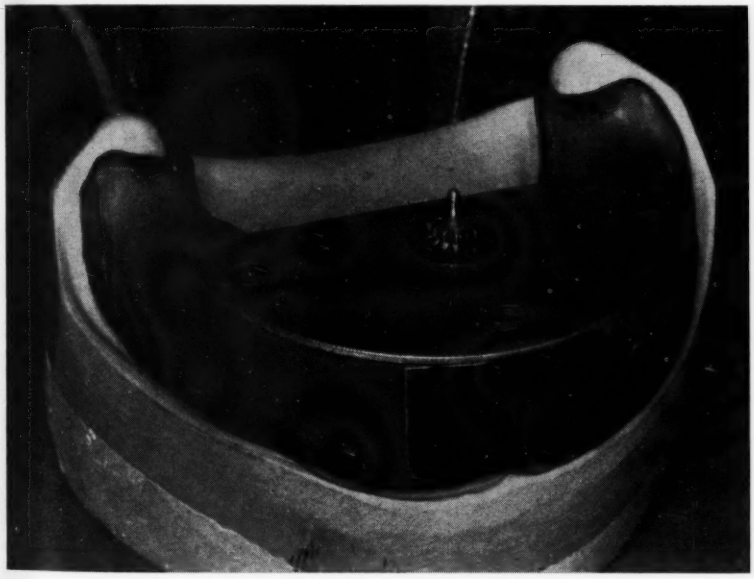


1.
Lower bite-rim, showing centric jack and vertical tracing plate, anteriorly.



2.
Vertical line inscribed on the tracing plate when the patient swallows.

3.
Horizontal line drawn perpendicular to the vertical line at the base point of the vertical line.



4.
Centric jack in position.

3. When the patient swallows, the vertical spring will inscribe a vertical line on the inked vertical plate mounted on the lower bite-rim (Fig. 2). The base of this line is the patient's functional vertical dimension and is all important. This base point of the vertical line is sharply defined by drawing a horizontal line perpendicular to it (Fig. 3).

Accuracy of Original Registration Proved—1. Ink over the vertical line, leaving only the horizontal line showing on the inked plate.

2. Have the patient repeat the "reflex" swallowing action and carefully check the terminal position on the vertical line reinscribed on the plate. If the original registration was correct, it will terminate exactly at the horizontal line.

3. Failure to reach the horizontal line or extension beyond it indicates an error in the original registration.

Swallowing Movement Recorded—It has been demonstrated that when an edentulous person swallows he will swallow at his own proper vertical dimension. The vertical spring, therefore, simply records his natural swallowing movement to provide a true reading of vertical dimension.

Centric Relation Obtained—1. The centric jack is positioned and luted to the lower bite-rim (Fig. 4). Before the gothic arch tracing can be recorded, however, the dentist must be sure that the vertical dimension is correct. A wrench is provided (Fig. 5) which can raise or lower the stylus on the centric jack several millimeters.

2. Both rims are inserted and the patient is instructed to close until the jack stylus is in contact with the centric tracing plate. The patient's lips are separated and the position of the end of the vertical spring is noted. If it is not exactly at the junction of the vertical and horizontal lines on the vertical tracing plate, it is brought to this position by turning the handle of the wrench.

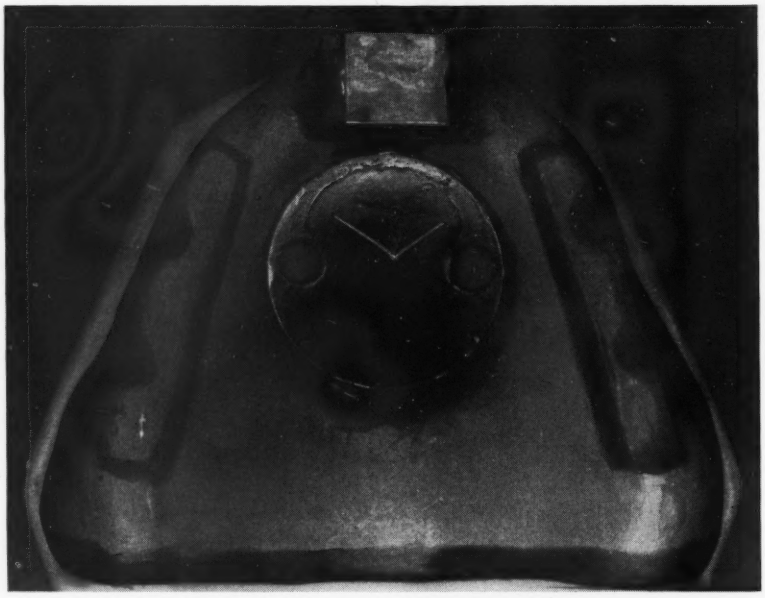
3. When the correct vertical is assured, the vertical spring is removed and the patient is asked to slide the lower jaw laterally and anteriorly. The typical gothic arch triangle is obtained on the centric tracing plate (Fig. 6). The apex of this triangle is the patient's centric relation reading, since by definition, it is the most retruded position from which lateral excursions can be made.

4. The hole in the plastic wafer is centered directly over the apex of the gothic arch triangle and the wafer is luted with sticky wax to the tracing plate (Fig. 7). The rim is returned to the mouth and the patient is asked to slide his lower jaw until the centric stylus slips into the hole in the plastic wafer.

5. (top)
Wrench inserted into the centric tracing jack.

6. (center)
Typical gothic arch pattern on the upper tracing plate.

7. (bottom)
Plastic wafer luted to the centric tracing plate with hole in the wafer directly over the apex of the triangle.



Concluding Steps

1. Upper and lower rims are joined together with quick setting plaster which is flowed from one bicuspid area anteriorly to the other bicuspid area. While the plaster is setting the patient is asked to bring his lips over the plaster. In this way, the plaster will serve the double purpose of joining the two rims and giving the laboratory an accurate appraisal of the patient's lip lines and midline.

2. The united rims are removed from the mouth and sent to the laboratory where they are accurately mounted. The denture cases are completed from this point in the conventional way.

Conclusion

A simple but accurate method for obtaining vertical dimension and centric relation in full denture prosthesis is available to the general practitioner. No drastic changes are necessary in the dentist's individual approach and no elaborate armamentarium is required. The technique provides the highly accurate centric gothic arch tracing, but is unique because it includes an accurate method for obtaining vertical dimension. These are two of the most basic factors for success in full denture prosthesis.

692 *North Pearl Street*

EXCISIONAL BIOPSY *Technique*: Report of a Case*

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FRANCIS LOCK, D.D.S.,*** Honolulu, Hawaii

DIGEST

Many oral lesions appear similar clinically, while others may appear distorted because of mastication trauma and moisture in the mouth. Biopsy is essential to confirm the clinical impression by microscopic verification to establish a correct diagnosis and also to remove the nonphysiologic tissue which has a greater potential to become malignant than normal tissue. This article describes a simple biopsy technique for lesions of this type.

Biopsy Classification

Biopsies may be classified into two general categories:

1. Incisional biopsy, when only a part of the lesion is removed.

2. Excisional biopsy, when the lesion is removed in its entirety.

Applications—Generally, if the lesion is less than a centimeter in diameter, it should be totally excised at the time of biopsy. Lesions larger than one centimeter are usually reserved for more extensive surgical treatment by using the incisional type of biopsy, so that treatment may be properly planned after obtaining the diagnosis.

Exception—An exception to incisional biopsy should be made in case of a melanoma, which in the author's opinion should always be totally excised.

Whichever method is selected in obtaining the biopsy specimen, care must be used in handling the tissue. Mutilated and distorted specimens make histologic study difficult, if not impossible, for the pathologist.

Biopsy Procedure

Soft tissue specimens of the oral cavity can often be removed for biopsy and a primary closure completed, especially in the tongue, cheek, or floor of the mouth. The specimen should be placed immediately in 10 per cent formalin and sent to the pathologist with an adequate history, information on the duration and location of the lesion.

Observation Recommended — The patient should be observed postoperatively and advised of the microscopic diagnosis. At this time if further treatment is indicated, it should begin without delay.

Patient may be Referred—If the treatment plan is not in the province of the general practitioner, the responsibility of the practitioner is to refer the patient at once for continued treatment.

Case Report

The following is the report of a fibroma of the buccal mucosa which was verified histologically after an excisional biopsy.

History—The patient was a 58-year-old white man who was admitted to the oral surgery service of Research and Educational Hospitals for diagnosis and treatment of a mass in the cheek of unknown duration.

General Examination — Examination revealed a well-developed 58-year-old man who appeared in good health. His weight was 155 pounds; height 5 feet 1 inch; and blood pressure 128/80.

Oral Examination—A raised firm mass measuring about 1 centimeter by 1 centimeter by 0.5 centimeter was revealed in the left buccal mucosa (Fig. 1). The sessile mass had a firm consistency and a smooth covering of normal appearing oral mucosal tissue. It was freely movable, nontender and had no evidence of trauma. No lymphadenopathy was detected. The remainder of the physical examination and the laboratory findings were within normal limits.

The clinical impression was that of a fibroma.

Total Excisional Biopsy

Because of the size of the lesion, its location, and traumatic potential, and in order to confirm the clinical diagnosis, the patient was scheduled for a complete excisional biopsy.

Procedure—1. A field block of the tissue surrounding the lesion was accomplished with 2 per cent lidocaine containing 1:100,000 epinephrine.

2. With a No. 15 Bard-Parker blade an elliptical incision was made about 2 millimeters beneath the lower border of the mass (Fig. 2). Using both sharp and blunt dissection, this incision was carried upward and under the base of the mass to normal tissue (Fig. 3).

3. After reaching normal tissue, a portion of the normal mucosa beneath the lesion was carefully grasped with an Allis clamp and the mass elevated

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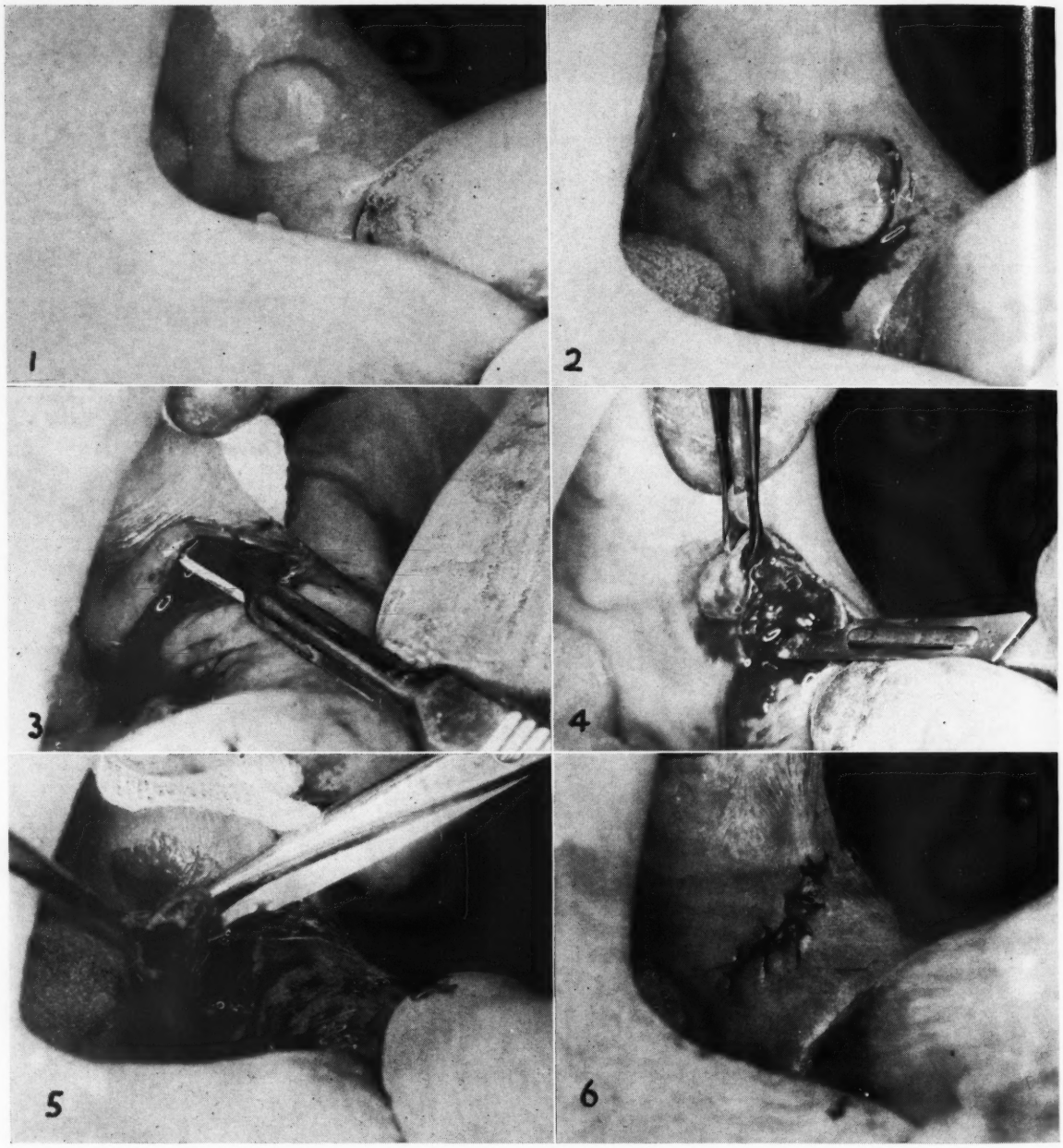


1.
A mass is revealed in the left buccal mucosa.
2.
The initial incision is made beneath the lower border of the mass.
3.
The incision is extended below the base of the mass.
4.
The mass is elevated with an Allis clamp.
5.
The mass is completely severed with scissors.
6.
Sutures in place.

(Fig. 4). Sharp and blunt dissection was employed to extend this incision superficially.

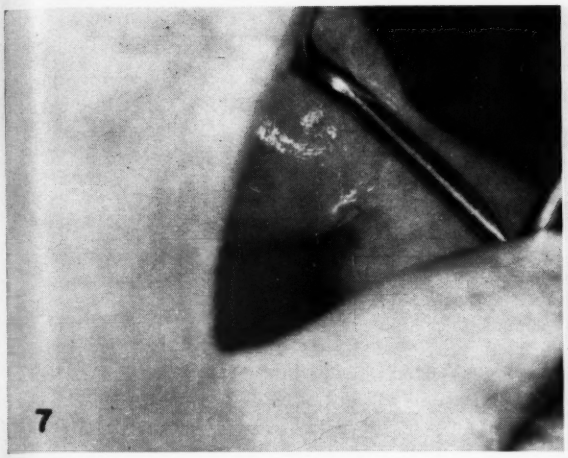
4. The oral mucosa superior to the mass was undermined with the scalpel before the mass was completely severed from the buccal mucosa with scissors (Fig. 5).

5. The mucosa of the inferior portion of the wound was undermined with the scalpel, hemostasis secured, and the wound edges sutured together with interrupted 0000 silk sutures (Fig. 6).

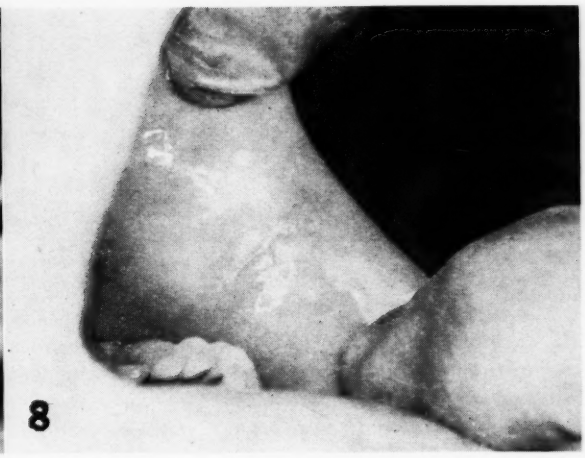
6. The specimen was placed in a 10 per cent formalin solution.

Pathologic Conclusions

Gross—The specimen was received in formalin and consisted of a single nodule 1 centimeter by 1 centimeter and 8 millimeters in diameter. The surface was smooth and red. The cut surface was homogenous and red.



7.
Two weeks after the operation.



8.
One month after the operation.

Microscopic—The section revealed a parakeratotic stratified squamous epithelium with an intact basement membrane. There were only rare lymphocytes and plasma cells present in the layer adjacent to the epithelium. The core of the lesion consisted of dense, coarse collogenous bundles showing hyalinization. There were a considerable number of capillaries and toward the lower portion, some striated muscle fibers were noted.

Diagnosis—The condition was diagnosed as fibroma.

Postoperative Observation

The patient was seen for suture removal seven days later. He was again observed two weeks after surgery; the area had healed by primary intention (Fig. 7). When seen again one month later the area of total excisional biopsy was essentially negative (Fig. 8).

Comment

Fibromas of this area in the cheek mucosa are not unusual, since mastication, trauma, sucking, and dental appliances predispose to continuous trauma. These hard and/or soft lesions are characterized by being well encapsulated, slow growing, raised, and easily traumatized.

The biopsy technique described is advantageous because it is simple and direct, does not injure the lesion or the adjacent tissue during surgery, and because bleeding over the mass is eliminated. Bleeding from an elliptical incision superior to the mass usually obliterates the operative field. It is for this reason that the superior portion of the mass is severed late in the procedure.

Vasoconstrictor Advised—The local anesthetic agent should contain a vasoconstrictor whenever feasible because it aids in hemostasis during surgery.

The antiseptic agent applied prior to the needle insertion should not be placed directly on the mass because of the possibility of injury to the mass and also because a solution containing a coloring agent may mask the true color of the specimen from the pathologist.

Summary

A case report is utilized to describe by illustrations, a total excisional biopsy technique for clinically benign lesions of the oral cavity. Clinical findings are usually diagnostic, but a biopsy is necessary and histologic studies are essential in arriving at a final diagnosis.

1011 *Lake Street*

[1]Thoma, K. H.: Oral Pathology, St. Louis, C. V. Mosby Company, 1954.
[2]Bhaskar, S. N., and Weinmann, J. P.: Tumors of the Minor Salivary Glands, Oral Surg; Oral Med; and Oral Path. **8**:1278 (December) 1955.
[3]Bauer, W. H., and Bauer, J. D.: The So-Called "Congenital Epulis," Oral Surg; Oral Med; and Oral Path. **6**:1065 (Sept.) 1953.

ADDRESS CHANGES

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Pressure Dressing for

EXTERNAL ORAL SURGERY PROCEDURES

CHARLES M. HYDER, D.D.S., Knoxville, Tennessee

DIGEST

All surgical procedures in the area of the mouth and face result in a certain amount of swelling. Most postoperative discomfort is caused by swelling and the tissue tension that results. The vascularity of the area as well as the numerous muscle layers and complicated structures such as nerves and glands do not permit the same type of sharp dissection possible in other areas of the body. The use of blunt dissection in the region of the mouth and face is the rule rather than the exception if these important structures are to be relatively undamaged and preserved in a functioning condition. For this reason there is more trauma and thus more swelling as the normal postsurgical reaction of the tissues in the facial region. The normal reaction is edema and capillary congestion as well as the extravasation of blood and tissue fluid into the area. This article describes a method to reduce postoperative swelling in oral and maxillofacial surgical procedures.

Use of Wire Sutures

To aid in reducing the amount of postoperative swelling from extravasation and congestion, the use of stainless steel wire sutures placed in the depth of the surgical opening and extending well beyond the incision on both sides has been found helpful.

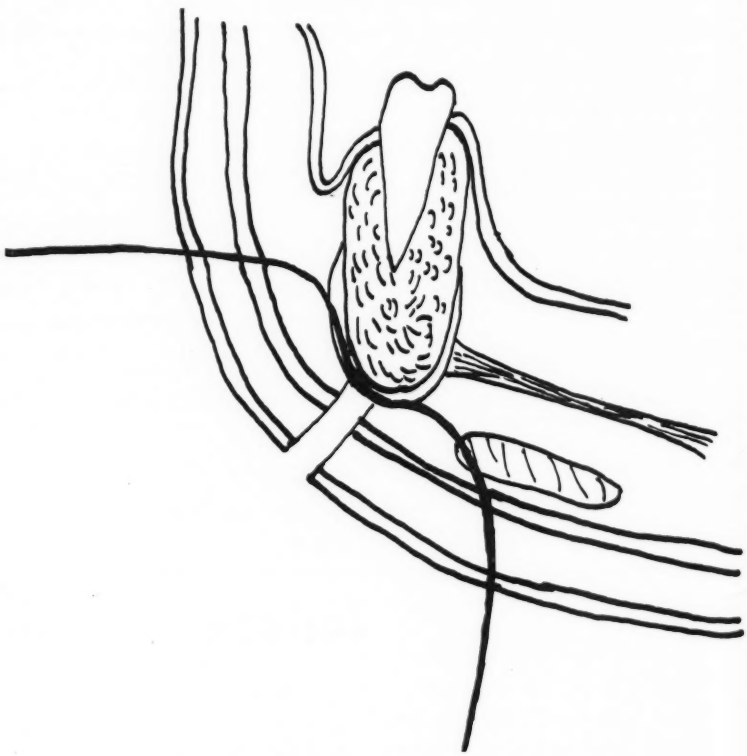
Pressure Applied—These sutures, when tied over a fluff dressing separated from the skin incision and the skin sutures by a nonadhering dressing such as medicated gauze, exert pressure on the site of the incision and over the surgically traumatized area.

Advantages—1. The pressure prevents the escape of the tissue fluids and flooding of the area.

2. The circulation of blood to the superficial area is reduced which aids in the prevention of swelling.

3. The sutures will help to hold the incision edges together, acting as tension sutures if there is swelling and they may also be of some assistance in reducing postoperative bleeding if the buried and superficial sutures are inadequate or at fault for some unforeseen reason.

Problem of Adequate Dressing—In some areas of the body it is not difficult to apply pressure dressings. On an arm or leg, for instance, or even around the chest or abdomen a "wrap around" bandage or a pad in conjunction with elastic gauze will provide an adequate dressing with almost any degree of pressure desired. In the region of the head and neck this is either an impossibility or a makeshift dressing is utilized as the best available. In this situation the operator may know that a pressure dressing is needed but may not be equipped to apply one or it may be anatomically impossible to apply a suitable bandage type dressing.



1.
The stainless steel suture in place in the depth of the incision making an exit on the skin surface approximately one inch from the wound margin.

Indications for Use

The type of pressure dressing described here is indicated for any type of surgery in the maxillofacial region with the possible exception of an extremely simple incision or excision. The method is useful in the following situations:

1. Open reductions of fractures
2. Submaxillary gland procedures
3. Procedures in the area of the temporomandibular joint
4. The removal of cysts and tumors
5. The removal of impacted or unerupted teeth when the external approach is necessary
6. Traumatic surgery from an external approach which is expected to cause some swelling.

The only important exception is that where a primary closure is not indicated.

Method of Application

The stainless steel wire sutures employed are of single strand wire of approximately thirty-two gauge. An eighteen-inch length is usually adequate for each suture. The following steps are taken:

1. One end of the wire is placed on either side of the incision starting in the deepest portion or through the deepest part of the reflected flap if it is this type of approach.

2. A large curved round or cutting needle may be used, or if access permits, a straight skin needle may be used to place the ends on the skin surface approximately one inch from the incision on either side.

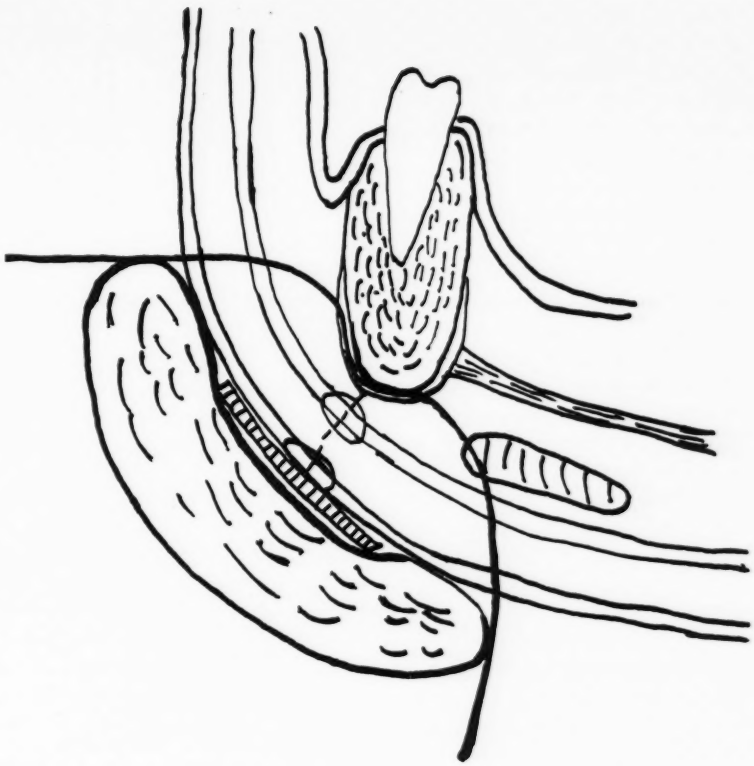
3. Any number of sutures may be used depending on the length of the incision. Usually one suture for each inch of incision is adequate with a minimum of two sutures for any incision.

4. In the case of a short incision or in situations where more pressure is necessary a third suture may be placed in a lengthwise position with its exit on the skin surface one inch beyond the end of the skin opening and with one end at each end of the incision.

5. The distance from the incision depends (1) upon the undermining extent of the dissection, (2) on the amount and degree of soft tissue retraction, (3) location of the incision, (4) adjacent structures, (5) the extent of surface available on which some degree of pressure is desired, and (6) the amount of swelling anticipated.

6. Knowledge of the adjacent structures and tissues will aid in placement and prevent unnecessary injury from improper location or impingement.

7. After the sutures are in place the wire ends are clamped with hemostats to aid in keeping the ends out of the field while the wound is being sutured.



2.
Pressure suture in position and deep sutures and skin sutures placed. A nonadherent dressing is in place directly over the incision and the fluff is in position with pressure sutures ready to be tied.

Postoperative Measures

1. Deep, superficial, or skin sutures may be placed in a normal manner with no change in location or procedure.

2. A nonadhering dressing is placed over the skin sutures completely covering the sutures and the skin wound. Over this a "fluff," a smooth ball, or roll of unfolded or loosely folded gauze, is placed to allow the wire sutures, when tied, to exert pressure on the underlying tissues by means of the fluff and medicated gauze.

3. Too much tension on the skin by the wire is undesirable but there must be enough to supply pressure. If the wire pulls too much on the skin it has been placed too far from the incision; this error can be corrected by increasing the width or length of the fluff.

4. After all wires are tied satisfactorily the entire dressing may be covered by elastic adhesive tape. This tape adapts to the bulk of the dressing and covers the area better than most regular tapes.

The Tape Can Be Changed—The general appearance of the finished dressing is of a large rounded pad covered with flesh colored tape. The overlying tape can be changed, when necessary, and the bulk of the underlying dressing can be left undisturbed.

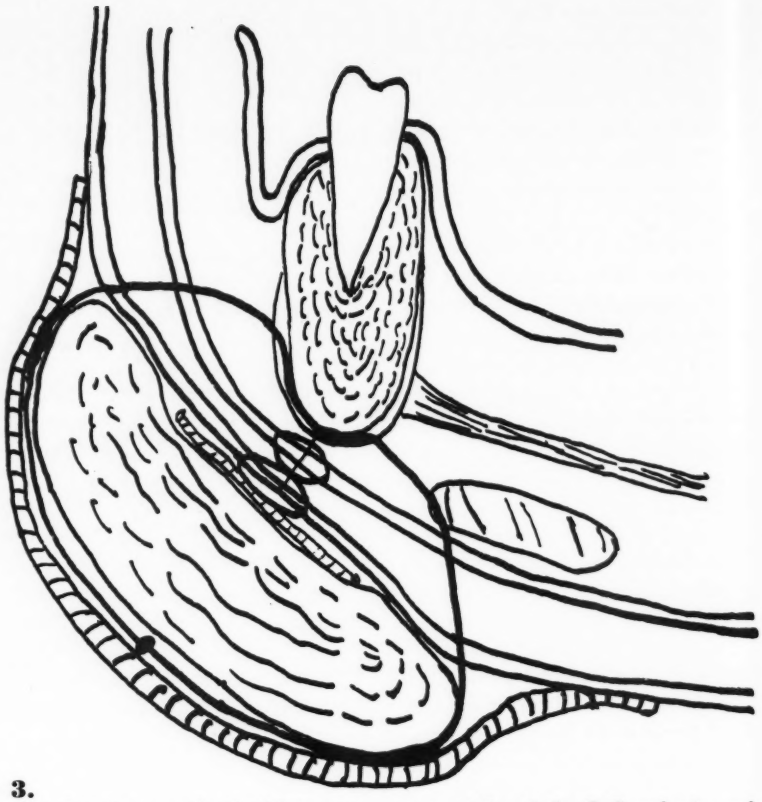
Removal of Pressure Sutures and

Dressing — This may be done after three days depending on the type and severity of the surgery and the tissue reaction. When the sutures are removed the swelling should be subsiding and healing in progress.

Method—The sutures are easily removed with no discomfort to the patient:

1. One side only is cut on each wire. This is done by slightly pressing in on the skin surface around the wire and cutting it slightly below the skin surface. When one side is cut on each wire the entire dressing may be removed intact leaving the medicated gauze over the healing incision.

2. If healing is satisfactory the skin sutures may be removed at the same time or they may be removed later.



3.
The dressing completed with pressure sutures tied and the fluff and wire ends covered with elastic tape.

Comments

When properly utilized this method of pressure dressing will aid the oral surgeon in reducing postoperative swelling and facilitating healing. Much postoperative discomfort is the result of tension in swollen and engorged tissues; by this method some discomfort as well as swelling is avoided.

Although not limited to the maxillofacial region, this type of pressure dressing is of maximum benefit in this area because it is especially suitable for use where bandage application is inadequate or impossible.

The stainless steel sutures are appropriate because there is no reaction between the tissues and the suture material. Too much tension may occur with a tendency for the sutures to cut the tissue, or inadvertent faulty placement of the suture may cause discomfort from pressure or impingement.

Summary

A method is presented for using pressure dressings postoperatively in the maxillofacial region. The method is adaptable and can be used in almost any surgical procedure not of an infective nature. Reduction of swelling and decrease in pain are routine and the entire procedure is completed as a part of normal wound dressing.

309 *Blount Professional Building*

Treatment of Precancerous Oral Mucous Membranes

Studies were reported at the annual meeting of the *American Surgical Association* in San Francisco, 1959, showing that precancerous oral conditions can be returned to normal. In an initial study reported by George S. Sharp of Pasadena, California, a specific complaint was chosen; marked intolerance to dentures.

Symptoms Reported—This affected 34 of 350 patients with obvious atrophic precancerous oral mucous membranes. None was able to wear the dentures overnight, and most complained also of difficulty in eating as well as soreness, rawness, burning, and dryness of the mouth.

Specific Therapy Applied—The literature contains reports of the therapeutic use of vitamins, brewer's yeast, and crude liver, and discussions of the relation between atrophy of the oral mucosa and the state of the mucosa throughout the body.

Subjective Relief of Denture Discomfort—Various combinations were screened, and it was found that a tablet consisting of 750 milligrams of pulverized crude liver, 10 micrograms of vitamin B_{12}, and 1.5 milligrams of riboflavin taken 3 to 6 times a day provided subjective relief of denture irritation within two to four weeks in 30 of the 34 patients.

Objective Improvement Noted—After six months of this regimen there was also marked objective improvement in the oral mucosa with fewer signs of irritability. Superficial ulcerations healed, leukodermia disappeared, leukoplakia became thinner and, in a few persons, disappeared.

Adapted from *Medical Science* 5: 894 (Jan. 25) 1959.

PRINCIPLES *and* TECHNIQUES

of Fixed Prostheses: PART ONE

SIDNEY ROSENBERG, D.D.S., L.D.S., London

DIGEST

As no single material, pontic, or abutment will completely satisfy all the requirements of a fixed prosthesis, the dentist must make a careful assessment of (1) all the destructive forces the restoration will have to withstand, and (2) the esthetic requirements of the patient and design his appliance to satisfy these demands as closely as possible. This paper which is the first of two installments is limited to a step-by-step description of a "one-impression" technique for the construction of a fixed prosthesis and a brief discussion of the relative merits of different types of abutments and pontics.

Diagnostic Considerations

Because its construction often involves the mutilation of sound teeth a serious effort should be made to ensure the longevity of a fixed prosthesis. Apart from failures which are due to faulty preparation of the abutments (such as excessive tapering) and to poor workmanship, failures are usually due to errors in diagnosis. The most common source of failure is due to inadequate retention in relation to the destructive forces the bridge must withstand. At the first visit a careful assessment should be made of the factors which will determine the suitability of this type of restoration.

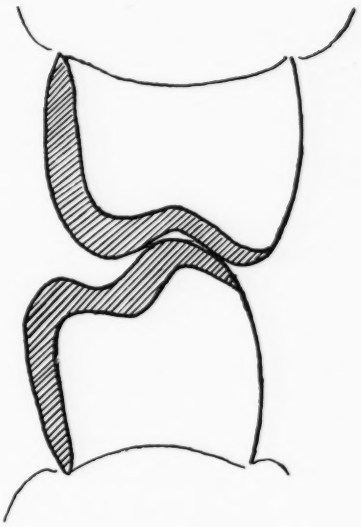
Examination—General Observations

Impact of Forces Assessed—The forces applied to the pontics have to be borne entirely by the abutment teeth. It is therefore desirable that (1) these forces be kept to the minimum consistent with reasonable masticatory efficiency, and (2) that the abutments and abutment teeth be as strong as possible. These forces should be assessed and the possibilities of reducing their impact considered. Women usually exert less masticatory force than males, the young and healthy more than the old and feeble.

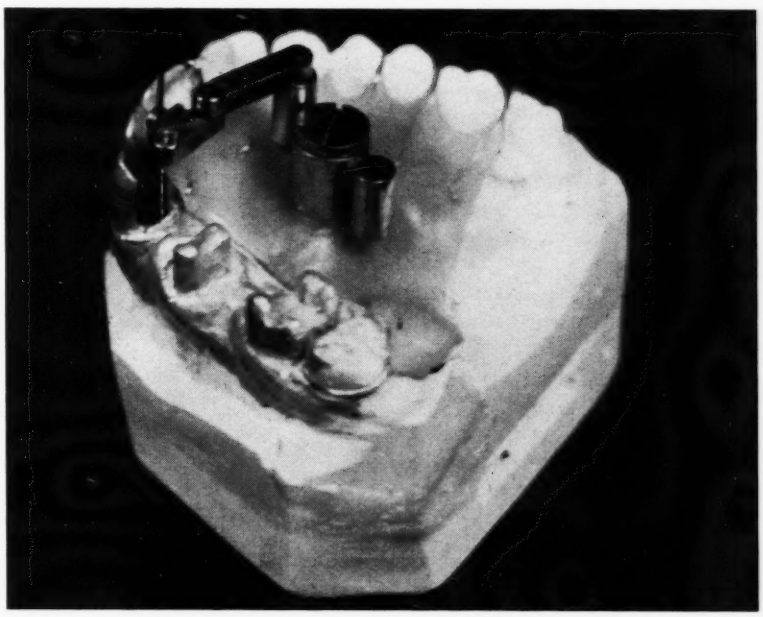
Preferred Shapes—Generally speaking long thick squarish teeth are preferable to short, round, or thin ones, and teeth with pronounced cusps are less satisfactory than those with shallow cusps. An anterior open bite is more favorable mechanically than a close, heavy bite for a bridge in that area. Frequently a gingivectomy can convert a short crown into a longer one, with obvious advantages.

Radiographic Examinations

After determining the mobility of



1.
Showing the extent to which the buccal cusps of the upper and lower posterior teeth must be overlaid.

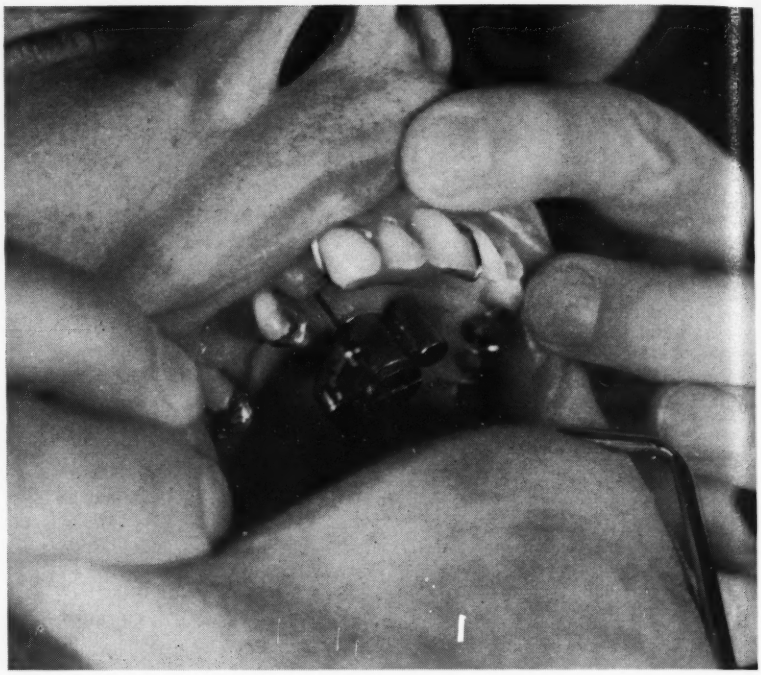


2.
This shows the paralleling device being used on the working model.

the teeth, a radiographic examination should show the length of the roots and their relationship to the length of the crown. One and a half times the length of the crown in a single rooted tooth is desirable, and the more root the better: a thick root will have a much greater area of supporting periodontal membrane than a thin tooth of corresponding length.

Supporting Bone Revealed — The thickness of the periodontal membrane (which can range from 0.10 millimeter when the tooth is out of occlusion to 0.35 millimeter when the tooth is subjected to heavy occlusal stresses), the apical conditions of the tooth, and the amount and character of the supporting bone will be revealed.

Ideal Abutment Tooth—A prospective abutment tooth should have not less than two-thirds of its root well supported by alveolar bone, with the trabeculae uniform, and the marrow spaces small.



2A.
The paralleling device in the mouth.

Types of Bridge

These may be classified as rigid, semi-rigid, cantilever, spring, or a combination of these.

Description—Rigid bridges are soldered to all the retainers, semi-rigid are soldered to some and rest in others.

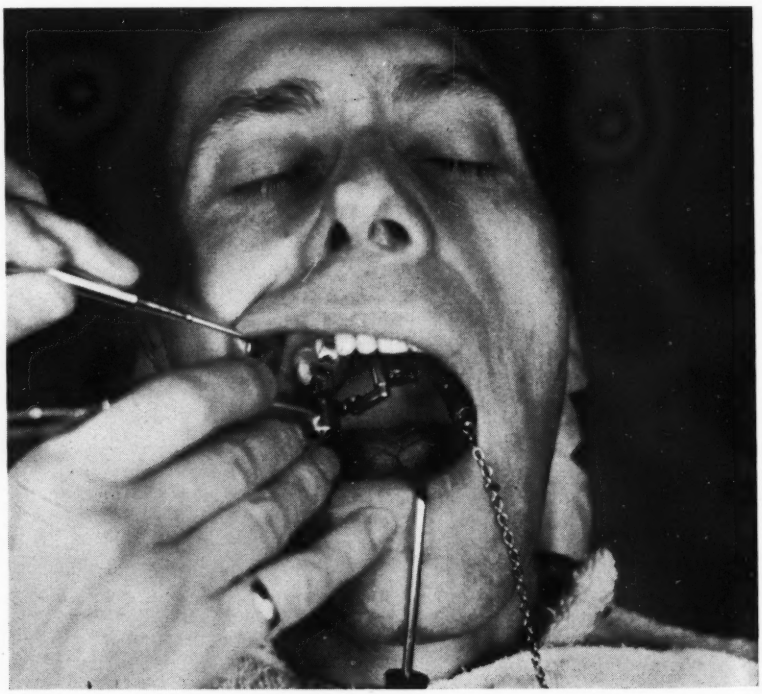
Direction of Forces — A bridge should be designed so that the forces to which it will be subjected tend to seat the bridge on its abutments and to be directed along the long axis of the abutment teeth.

Retainers—Average Requirements

With the exception of those teeth used as indirect retainers, all abutments should have full occlusal coverage so that it is impossible for a force to be applied to an abutment tooth to drive it apically out of the prosthesis. Where an indirect retainer is used, full occlusal coverage on that tooth is not essential provided the abutment can move along the line of force out of the "occlusal rest."

Occlusal Coverage—It should be borne in mind that in the normal arch the buccal cusps of the upper posterior teeth overlap the buccal cusps of the lower posterior teeth. The gold should therefore be extended farther over the buccal cusps of the lower teeth than over the upper ones, to eliminate damage to the cut, or weakened enamel rods which would result in caries and failure of the restoration (Fig. 1).

Gold Must be Hard—The gold must be thick enough and hard enough to



2B.
The paralleling device in use.

resist buckling and crushing the underlying enamel. This also applies to gold covering the occlusal surfaces of porcelain pontics.

Alternative Type May be Necessary — If observing these precautions would result in an undesirable display of gold, an alternative type of retainer must be sought; a full crown with a veneer of porcelain or acrylic.

Classification of Retainers

1. Direct: Cemented to the abutment tooth.
   (a) Intracoronal: inlay.
   (b) Extracoronal: veneer crowns.
   (c) Radicular: post crown.
2. Indirect: Stress breakers or occlusal rests.
   (a) Intracoronal: resting within an inlay or crown.
   (b) Extracoronal: a spur resting on the lingual or occlusal surfaces of a tooth, inlay, or crown.

Adaptation of Types—Full veneer crowns or partial veneer crowns are suitable for the restoration of most abutment teeth and are perhaps the strongest and mechanically most satisfactory retainers. In a tooth with a long crown the intracoronal type of retainer can be quite satisfactory; occlusal grooves should be deep and not too wide buccolingually so as to avoid weakening the buccal and lingual cusps, and the walls should be nearly parallel.

Displacement Forces — The three most important features to be incorporated in the preparations to resist forces tending to displace the retainer are:

(1) Adequate occlusal dovetail.
(2) Reverse bevel of the gingival floor.
(3) Pits.

The retainer must fit the abutment accurately and the surfaces of the retainers to which the pontics are to be soldered should be extended bucally and lingually enough to ensure that the margins will be free from solder.

Pontics

Whatever the type of pontic selected, that part in contact with the ridge should have the highest possible glaze and be so designed as to be virtually self-cleansing. This can be done by making the fitting surface of the pontic convex mesiodistally.

Fundamental Factors—In the upper arch, esthetic requirements demand that pontics anterior to the first molar fit the ridge fairly closely but, in the lower arch, to facilitate cleansing, the posterior teeth may be kept well clear of the ridge. Occlusally their buccolingual dimension should be considerably reduced. By doing this, reducing the proximolingual angles and providing sluices, the occlusal surfaces can be reduced to half or one-third of that of the teeth they are replacing. The amount of reduction must be determined by the operator in reference to the physiologic condition of the mouth. Pontics opposing full or partial dentures need be reduced less than those opposing strong healthy teeth.

Determining Line of Insertion — Usually this is from the occlusal apically or along the long axis of the tooth, but if three-quarter crown type of retainers are being employed much tooth structure can be conserved and less gold displayed by making the bridge to be inserted somewhat from the lingual side. To do so the approximal surfaces of the teeth involved must be parallel or nearly so.

Maximum Resistance to Occlusal Displacement — The preparations should be cut as nearly parallel both within the teeth themselves and to all other preparations as possible; to facilitate this cutting and to obviate the natural inclinations to play safe and taper excessively, there are various mechanical means to aid the operator's eye.

Mechanical Aid — The guide or paralleling device to be made as shown in Figure 2 is constructed on the study model with the base in acrylic, and consists of a thick post around which fits a tube to which are soldered smaller tubes. These carry a jointed arm holding at its extremity a pin at right angles to the arm and parallel to the tube, which can revolve easily around the post. This is positioned in the approximate center of the model and adjusted so that the pin is parallel with the proposed line of insertion of the prosthesis.

Processed in Acrylic: The case is waxed up to cover the palate and extend to the lingual surfaces of the teeth with as many clasps as possible, usually of the orthodontic type, but care is taken to leave the abutment teeth free. It is processed in acrylic. Alternatively, with a little care, it can be made quickly on the model in self-curing acrylic.

Guide to Relationships: The appliance should snap easily in and out, and when in position be quite rigid. It is shown in the mouth in Figure 2A, and in use in Figure 2B. The guide pin should be able to reach all those surfaces to be prepared on all the abutment teeth and thus serve as a guide to the operator in making the slices and cutting grooves, and also as a quick and easy check on the relationship of the completed preparations to each other.

(End of Part One)

Adapted from *British Dental Journal* **107**:379 (Dec. 15) 1959.

Marsupialization of

MUCOUS CYSTS (*Mucoceles*)*

JULIUS G. GODWIN, D.D.S., St. Louis, Missouri

DIGEST

This article describes the causes and distinguishing features of lesions which are frequently found on the inside of the lips and cheeks. A step-by-step technique for treatment of mucous cysts by marsupialization is presented.

Etiology

Lip biting and other mechanical injuries to the excretory duct of mucous glands are responsible for the formation of mucous cysts (mucoceles). As a consequence of the trauma mucus will escape into the lamina propria and submucosa of the oral mucosa. The size of the cyst is determined by the amount of secretion produced by the affected gland. In some cases partial obstruction of the duct and inflammation may also cause and aggravate a lesion of this kind.

Clinical Features

Mucous cysts appear as small, fluctuant, bluish-tinted protuberances on the lips and cheeks, particularly on the inside of the lower lip (Figs. 1 and 2). They often rupture, heal, and may reform when they become distended with mucus. They are benign lesions, and grow slowly and without pain. When found on the undersurface of the tongue, they are called cysts of Blandin and Nuhn glands. A ranula, a retentive cyst like the mucous cyst, is most often associated with the sublingual salivary gland.

Differential Diagnosis

Hemangioma, herpetic lesion.

Histopathology

The fibrous connective tissue wall is thin. Its lumen may be lined with flattened squamous epithelium, depending on the amount of pressure and infection present.

Treatment

Marsupialization of the cyst is the treatment of choice. Simple incision and drainage will usually result in recurrence. Seldom does it become necessary to excise the involved gland. Neighboring glands should not be traumatized, otherwise new mucoceles may form. If nerves are injured, a neuroma may form.

Technique of Marsupialization (Partsch)

1. A small incision is made through the mucosa and the cyst wall at the top portion of the "dome" of the cystic area (Fig. 3, A and B).

2. The mucoid content is evacuated with the use of suction (Fig. 4).

3. Gauze is inserted through the incision into the collapsed cyst cavity to outline its size and thus facilitate surgical treatment (Figs. 5 and 3C).

4. With suitable scissors or scalpel the mucosa and its adherent cyst membrane are removed from the gauze-filled cavity by an incision all around the edge of the "dome," which corresponds to the cyst's widest perimeter (Fig. 3, D and E).

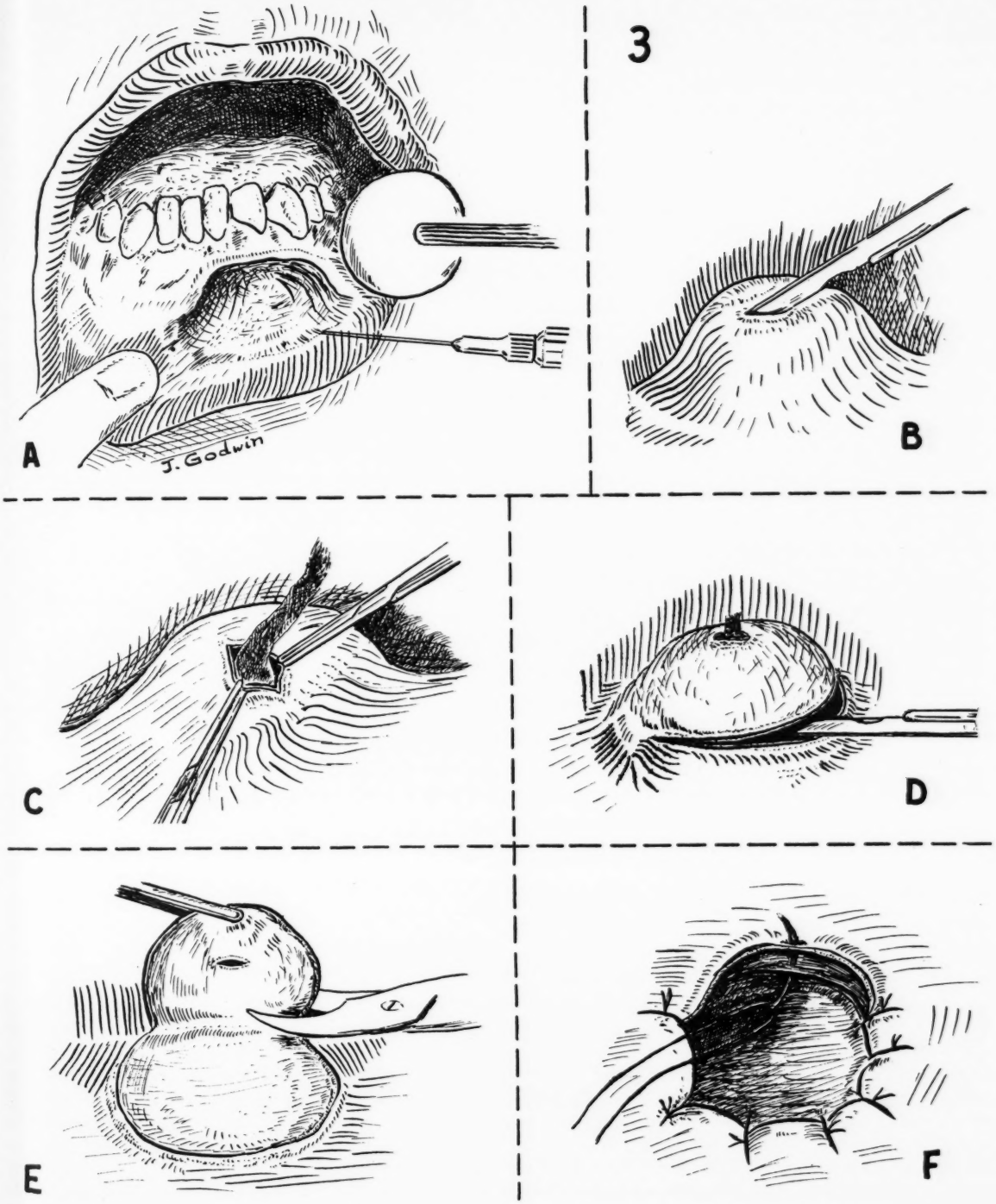
5. Interrupted silk sutures (ooo) are placed around the periphery by passing the needle through the oral

*From the Jewish Hospital, St. Louis, Missouri.

[1]Archer, W. H.: A Manual of Oral Surgery, ed. 2, Philadelphia, W. B. Saunders Company, 1956.
[2]Thoma, K. H.: Oral Pathology, ed. 4, St. Louis, C. V. Mosby Company, 1954.
[3]Reynolds, D. H., and Chaudhry, A. P.: Pathogenesis of Mucocele, J. D. Res., Preprinted Abstracts (March) 1960.

1.
A large mucocele is shown.

2.
Example of small mucocele due to lip biting.



3.

A. Infiltration or conduction anesthesia is administered.

B. Small incision at top of "dome" to evacuate mucoid fluid.

C. Gauze packed into collapsed cyst cavity.

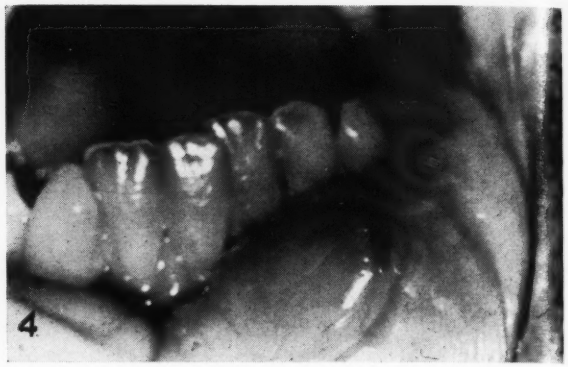
D. Incision all around the cyst's widest perimeter.

E. "Dome" portion of cyst excised after gauze has been removed from the cyst.

F. Using interrupted sutures the oral mucous membrane is sutured to the remaining cyst wall.

mucosa and then through the edge of the cyst wall that remains at the bottom of the cavity. The cyst lining will become part of the mucous membrane of the mouth. When healing is complete, the oral and cystic epithelium are continuous and cannot be distinguished (Figs. 3F and 6).

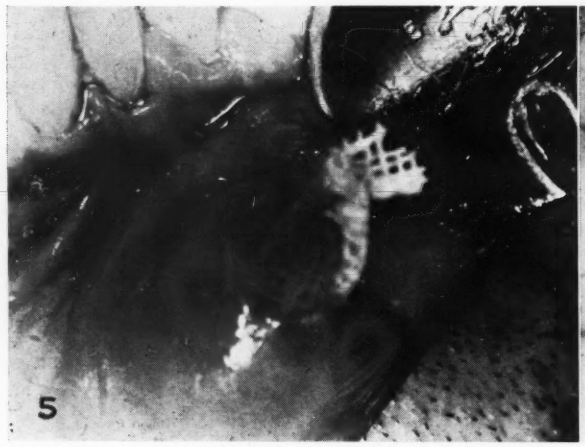
8515 *Delmar Boulevard*

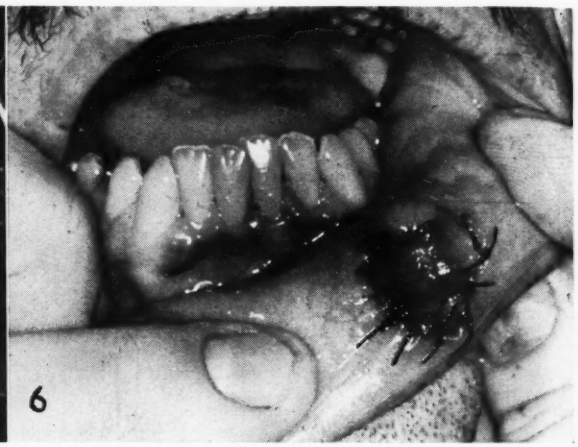


4.
Mucoid fluid escaping through small incision.

5.
Gauze inserted into collapsed cyst cavity.

6.
Remaining cyst wall at bottom of cavity sutured to oral mucosa.





Dental Surgery During Continuous Anticoagulant Therapy

S. J. BEHRMAN, D.D.S., and I. S. WRIGHT, M.D., New York

A Variety of Dental Surgery Completed

Dental surgery can be performed safely while patients are on anticoagulant therapy. Twenty patients on long-term anticoagulant therapy underwent 45 surgical procedures in a department of oral surgery. The procedures included extractions, "open" or "surgical" operations, alveolotomies, removal of chronic inflamed tissue, drainage of abscess, and insertion of Behrman magnetic implants. There was no incidence of unusual or serious hemorrhage. It is suggested that for surgery the anticoagulant therapy be held in the low optimal range, as for example, 22 to 25 seconds with a normal of 15 seconds (Quick's test). The recommended surgical technique may include the following steps to encourage clotting.

Surgical Steps

Four steps to encourage local clotting are taken as part of the surgical technique:

1. Pressure is applied constantly to the involved tissues even when, for example, a tooth is being luxated.

2. Foamed gelatin is placed in each socket to help serve as a matrix for clot formation.

3. Multiple sutures are placed under tension.

4. Heavy biting pressure is applied immediately postoperatively.

Postoperative Measures—After surgery, cold applications are employed. Measures are taken not to disturb the clots which have formed. No mouth rinses are permitted, hot liquids are avoided, and a soft diet is maintained.

Pressure Increased by Edema—Because the tissues are sutured tightly, postoperative edema increases local tissue tension and pressure on the vessels. It may be surmised also that the injured tissues and the tissues under pressure liberate thromboplastin which aids in local clotting.

Importance of Sutures

The placing of sutures at the time of surgery is most important, coapting the soft tissues as much as possible, decreasing the aperture of the extraction wound, and applying tension to slow blood flow. When possible, large

(*Continued on page* 208)

Removal of Teeth by

TOOTH DIVISION

PHILLIP M. CHERNOFF, D.D.S., Middletown, Connecticut

DIGEST

The removal in one piece of an impacted lower third molar was at one time considered a dramatic exhibition of skill. The technique in general use involved an extensive excision of mandibular bone above and surrounding the impacted tooth, and its delivery in toto by elevation with "exo-levers."

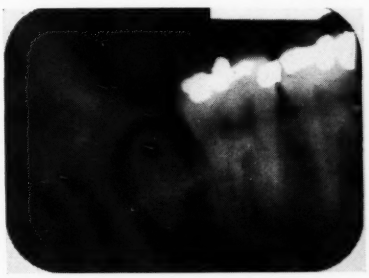
This article describes a modern technique which eliminates the necessity of bone removal as a prerequisite to tooth delivery. The important feature of the technique is division of the tooth and removal of the portion of the tooth that keeps it "locked in." After that segment is removed the remaining portion of the tooth is not only free of impaction but is provided with considerable free space through which it may be removed.

1. *Lower third molar in mesioangular impaction.*

2. *Groove made in crown of tooth to control line of cleavage.*

3. *Mesial segment of the crown removed.*

4. *Remainder of tooth elevated into the space vacated by mesial segment.*



5. *Tooth has been removed. Note that mandibular bone is intact.*

6. *Lower third molar in distoangular impaction.*

Preparatory Considerations

A study of the preoperative radiograph will determine what portion of the impacted tooth should be sectioned and removed to unlock it. The angle of the initial cut which is made with a fissure bur determines the line of cleavage accomplished by the chisel, preferably with the Impactor (Figs. 2 and 7). The Impactor delivers the thrust of a chisel without a "follow through" of force and is better tolerated by the patient.

This exodontic procedure is applicable to any multirooted tooth.

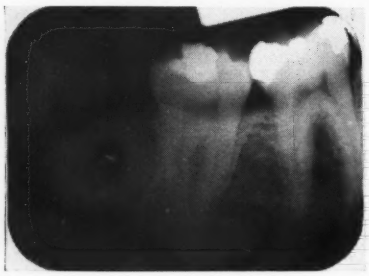
Part of Crown Left—It is essential to remove enough of the obstructing portion of the tooth to eliminate interference with elevation of the remainder, but it is advantageous to leave, when possible, some portion of the crown upon which leverage may be made with the elevator (Fig. 3).

The illustrations 1 through 5 show the procedures employed in a mesioangular impaction; Figures 6 through 9 show the procedures employed in the removal of a lower third molar in a distoangular impaction.

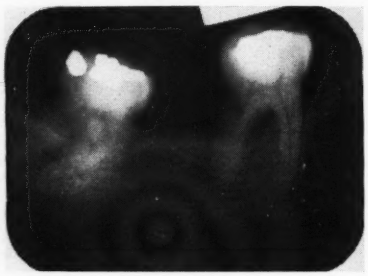
Advantage of Remaining Crown—It is inadvisable to remove the entire crown of an impacted lower third molar in this procedure to unlock it, as

7.
Groove made in the tooth to control line of cleavage.

8.
Distal segment of the crown removed.

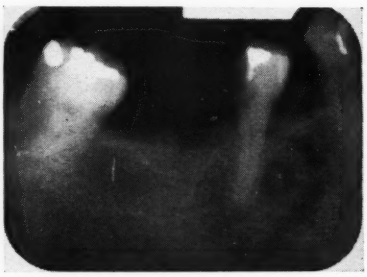


9.
The tooth has been removed. Note that bone is intact.



10.
Lower first molar with carious root. Bone is dense.

11.
Groove made to determine cleavage into mesial and distal segments.



12.
Distal segment removed as separate entity.

13.
Mesial segment removed. Note that the bone is intact.

14.
This condition should be avoided. Too much of the crown has been removed, making roots inaccessible.

the roots will then offer no available surface to guide the elevator point or to provide good leverage. Figure 14 illustrates such a condition; it should be avoided as it makes root removal more difficult than if a portion of the crown were available to raise with the elevator.

Procedure

The factors noted are taken into account to determine the position of the initial cut and, an important consideration, the angulation of the fissure bur when making it.

(1) A properly made groove will direct the line of cleavage when the Impactor is applied.

(2) The chisel point is placed into the groove and the force applied in the same direction as the groove is angulated so that the split is accomplished in the same line. This procedure provides controlled section of the tooth, limiting the amount of the crown to be removed and ensuring that with proper angulation no obstruction will remain when this segment of the tooth is removed with an elevator.

Extraction Simplified—When these procedures are completed the tooth to be extracted is no longer impacted and there is the advantage of considerable space, as shown in Figures 3 and 8, into which it may be elevated and through which the tooth can be easily removed.

Bone Remains Intact—This technique of tooth division readily transforms a difficult clinical problem into a comparatively simple operation. Note as shown in Figures 5 and 9 that this technique leaves the mandibular bone essentially intact.

Other Indications—(1) The procedure of tooth division may be employed in the presence of widely divergent roots. Anatomic variations of many types may militate against the removal of a tooth in toto but such cases may be simplified by tooth division.

(2) Figures 10 to 13 illustrate a case of a molar isolated in dense bone; the distal root is weakened by caries at the gingival line. An attempt to extract this tooth in toto might result in a fracture of the distal root and subsequent injury to bone in an effort to elevate the residual root. Division of the tooth into mesial and distal segments (Fig. 11) facilitated the removal of each segment with ease and without fracture. The bone was left intact (Fig. 13).

159 *Broad Street*

The EDITOR'S *Page*

SOME TEETH, like some persons, have a built-in resistance against disease. The number of teeth, among people living in the "civilized" state, that are resistant to caries is small, however, in proportion to the teeth that are attacked by this disease. The nature of resistance in any tissue is not well understood, although it is reported that experimentally it has been demonstrated that the *vitality* of the tooth and its capacity to resist carious attack is the key to the problem of dental caries.

Bodecker[1] believes that we have not given enough consideration to the role of the pulp as a biologic unit in caries resistance. Clinicians concede that the pulp is an organ that transports body fluids to and from the hard dental tissues and conducts sensory impulses to the higher nerve centers. Clinicians do not generally consider that the pulp plays a part in the susceptibility or resistance to caries.

Dental caries, as seen by Bodecker, "may be ranked as a common systemic disease, primarily dependent on a lowered resistance of the enamel to attack. Only after some as yet undetermined systemic disturbance has caused pathological changes in the enamel can it be attacked by microorganisms.

"On the basis of this hypothesis the most widespread of all diseases, dental caries, may reach an early solution by directing more intensive research into its systemic-predisposing causes."

The *modus operandi* of caries produced by systemic factors is "undetermined" (to use Bodecker's words). He hypothesizes that anything that alters the blood influences the dental lymph that is carried from the pulp to the dentin and enamel. It may be added that anything that alters the blood influences the saliva. Thus both the external and internal environment of the teeth may be affected by changes in the blood; systemic disturbances, such as malnutrition, may affect the welfare of the teeth.

Changes in the character of the blood may reduce the resistance of the hard dental tissues that are bathed on the outside in one biologic fluid (saliva) and nourished on the inside by another body fluid (dental lymph). All biologic fluids (saliva, lymph, hormones, digestive juices) have a common ancestor: blood.

In summarizing his point of view Bodecker emphasizes evidence of vitality in dentin and enamel:[1]

"1) Physiologically speaking, pulps removed on recently erupted teeth cause death of dentin and enamel, as indicated by the great increase in permeability of these two tissues—hence the function of the pulp is to give life to dentin and enamel.

"2) Secondary calcification—and probably also primary calcification of enamel is a function of the dental pulp which continues after tooth eruption. Thus the dental pulp with its profuse blood supply in young teeth is endowed with the vital function of completing the maturation of both dentin and enamel, occurring in the first 5-10 years after tooth eruption.

"3) The period of greatest caries incidence is coincidental with tooth maturation, viz. in the first 5-10 years after tooth eruption.

"4) Hence, we believe that malfunction of the pulp in our present 'civilized' state may be an important factor in lowering the resistance to attack by dental caries.

"In the light of this hypothesis, it seems that the time has come to take a more comprehensive view of the problem of dental caries. It seems necessary therefore, that far greater emphasis should be placed on a biologic approach toward the problem of dental caries in an attempt to determine the predisposing cause of this disease. The tooth must be regarded as a vital unit. It must be realized that attack from without is only on rare occasions combated by a *normal* resistance within the tooth because, in our 'civilized' state, the pulp is commonly in a debilitated condition and no longer fulfills its protective function.

"If and when we discover the reason why a small, a very small minority of persons are immune to dental caries in spite of eating sweets, in spite of poor oral hygiene, and in spite of an improper diet, we may be a step nearer to the control of this widespread disease."

The biologic philosophy of Bodecker's view is attractive. Research, however, must discover the exact nature of pulp debility from systemic causes before we can put the theory to clinical use.

[1]Bodecker, Charles F.: Tooth Vitality and Its Relation to Dental Caries, New York D. J. **26**:118-138 (March) 1960.

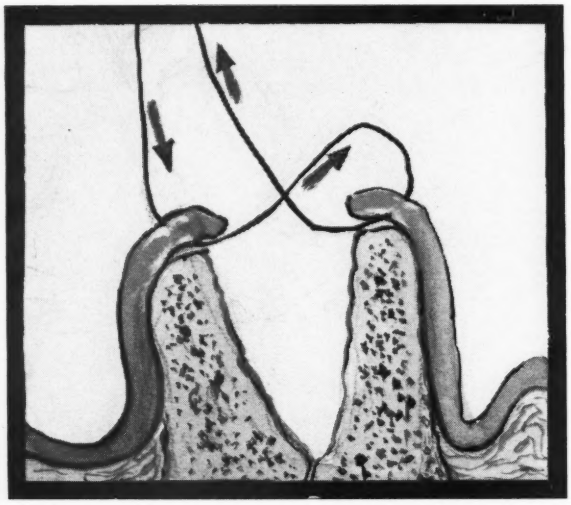
Clinical and Laborator

1

Cover for Audio-Analgesia Earphones

Henry Heimansohn, D.D.S., Danville, Indiana

1. Ordinary plastic headrest covers are placed over each earphone and an opening is made for the sound.

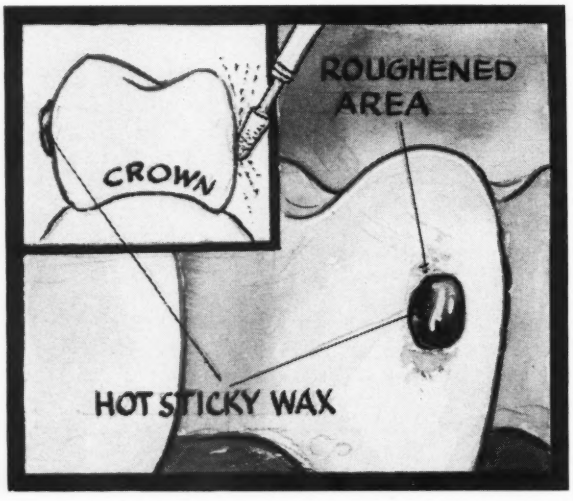


2

Suture Technique

D. W. Easthope, B.D.S., Newcastle, W. S. W., Australia

2. In suturing after multiple extractions use a figure of 8 suture to obtain better coaptation.



3

Accurate Seating of Abutments

W. Bernard Mack, D.D.S., St. Louis, Missouri

3. Roughen the crowns slightly on the buccal and lingual and cover the rough areas with sticky wax before taking the impression for a fixed bridge. The wax globules will hold the crown in the correct position in the impression.

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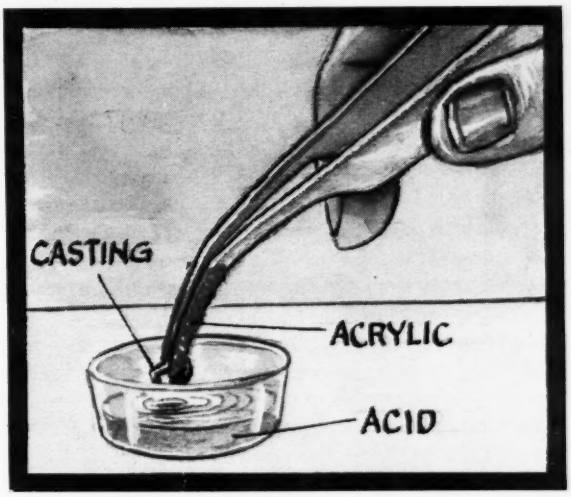
SUGGESTIONS . . .

Tongs for Removing Casting From Acid

Manuel I. Weisman, D.D.S., Augusta, Georgia

4. Cover the points of the soldering tweezer or cotton pliers with quick curing acrylic. This will prevent reaction between the metal and the acid when removing gold castings from the acid.

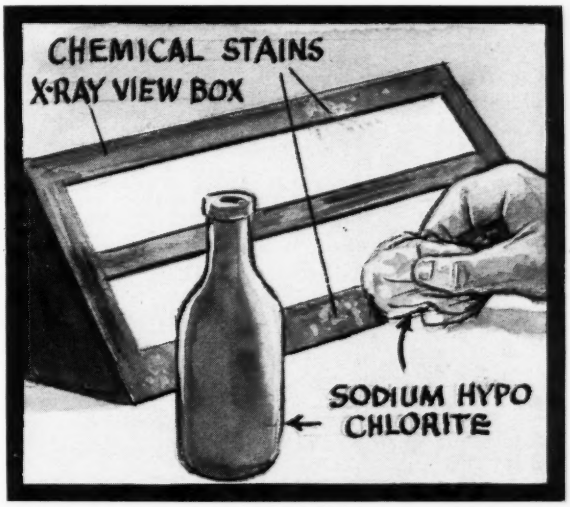


4

Removing Stains from X-ray Equipment

Ivan T. Shaurette, D.D.S., Phoenix, Arizona

5. Stains made by x-ray processing solutions may be removed from equipment with commercial sodium hypochlorite (Clorox® or Purex®).

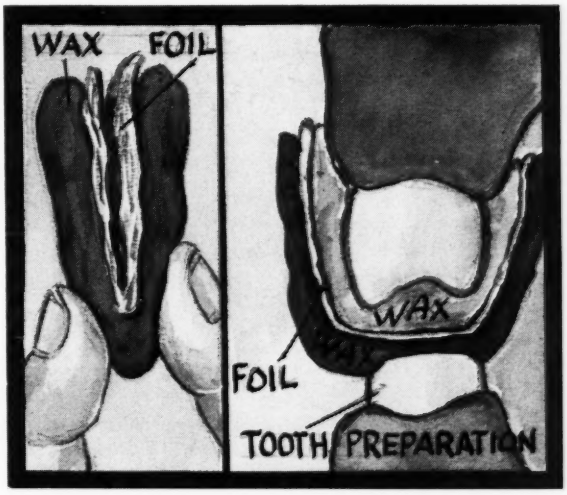


5

A Bite Impression Technique

George H. Royce, Jr., D.D.S., Tahlequah, Oklahoma

6. Fold regular wax over x-ray foil. Place over preparations and have patient bite in centric. Mold wax over the teeth. Pour upper half of bite for the model. Place the model of the preparations in the lower half of the bite-impression and mount on the articulator.



6

volved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 194 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

Cancer of the Colon and Rectum

Many colonic and rectal cancers are curable if removed soon after the first manifestations. In nearly half the cases, diagnosis is delayed more than six months after onset of warning pain, abnormal defecation, obvious bleeding, or other significant changes.

Tumors occur with equal frequency in men and women and most often after ages of 40 years. About one of 10 patients has an antecedent, possibly a precursor, lesion, most frequently a single polyp. Other forerunners are familial polyposis, ulcerative colitis, and previous cancer of the colon.

Approximately 75 per cent of the tumors are in the rectum and sigmoid where the majority can be seen with the proctosigmoidoscope. About half occur in the left half of the colon, from the middle of the transverse segment to the rectosigmoid junction.

Symptoms vary with location of the cancer. Since the right colon has a wide lumen, lesions may be far advanced before any manifestations appear. Most frequent are pain, anemia, weakness, a tumor, and obstructive symptoms. The lumen of the left colon is relatively small. Change in bowel habit, pain, obstructive symptoms, and gross blood in stools are most likely to appear early.

Rectal cancer usually causes bleeding first. Sensation of incomplete evacuation, change of bowel habit, and tenesmus are early symptoms.

Abdominal pain or discomfort in most cases is common and is often the chief complaint. Colicky cramps are most common, but a dull intermittent or constant ache or simply fullness may be felt. Location of pain varies and is generally related to position of the growth. Pain may extend toward the back from sigmoid lesions and to the lower abdomen from rectal cancer. Pain from rectal or left colonic tumor may be relieved by defecation or by passage of flatus.

Change in bowel habit, the second most frequent symptom, occurs in two-thirds of cases. This symptom is the commonest first manifestation.

Gross blood in stools is associated with 4 out of 5 neoplasms of the rectum and about half of those in the left colon. Blood is generally red and is on the outside of feces or intermixed. Gross blood can be found with some colonic tumors but is usually described as dark.

Other first symptoms are generally manifestations of advanced disease. Bowel obstruction is the presenting manifestations in about 1 in 9 cases and occurs mainly with left colonic tumors. Symptoms due to anemia, notably fatigue, appear first in 10 per cent of cases and are the chief manifestations in more than one-fourth of all patients. Weight loss exceeding 10 pounds is rather common, especially when the right colon is diseased. Symptoms from metastasis generally result from spread to the liver or occasionally to bone or lungs. A palpable mass is discovered during the first hospital examination in more than a third of all cases and in most patients with right colonic cancer.

Bockus, H. A.; Kalser, M. H.; Mouhran, K.; Laucks, R.; and Basset, J.: Early Clinical Manifestations of Cancer of the Colon and Rectum, Dis. Colon & Rectum **2**:58-68 (January) 1959.

Snake Bites

Most snake bites occur in remote areas. As a result, first aid usually must be applied by the victim himself or his companions. For years, tourniquets have been recommended to occlude the superficial lymphatics and thus lessen the systemic diffusion of the venom. Some authorities, however, feel that local tissue destruction is intensified by this method with no appreciable decrease in systemic spread.

Early suction may remove large quantities of venom. Incisions are made over the bite to the depth of the subcutaneous tissues and suction may be done by mouth if necessary. The venom is harmless unless the oral mucosa has an open wound. As the swelling spreads, incisions are made at the advancing edge and suction is applied there. If the bite is on an arm or leg, a series of incisions may be made to encircle the limb.

As soon as possible every victim of snake bite should be hospitalized. Blood should be typed and crossmatched before toxins from the snake venom make this impossible. Blood cell counts and urinalyses should be done frequently to check for hemorrhage and hemopysis. Visceral or cerebral hemorrhage is always a possibility or a coagulation defect may be discovered. Massive bleeding due to afibrinogenemia may be controlled by infusions of fibrinogen.

Although snake bite victims do survive without antivenin, most physicians do not have the experience to make the decision and should give antiserum for any bite that appears serious. Precautions must always be taken when any horse serum is used because serious allergic reactions are possible.

If the patient is seen within two hours after the bite, half of the initial dose of 10 to 50 cubic centimeters of antivenin is given in the vicinity of the bite and the other half intramuscularly or subcutaneously in the affected part

(*Continued on page* 191)

of the body. For advancing swelling and necrosis additional antivenin is given every one-half to two hours until the process is arrested. The smaller the patient the more antivenin is required because the venom is diluted. Intravenous administration may be necessary if the patient is in a coma or in a state of shock.

Extensive local excision is sometimes advocated but seems unnecessary unless necrosis or infection is severe. With extreme necrosis, amputation may sometimes save the patient's life. Relapses are rare and the patient is usually out of danger after the first forty-eight hours.

McCreay, Thomas, and Wurzel, Harold: Poisonous Snake Bites, JAMA **170**:268-272 (May 9) 1959.

Melanoma

The incidence of melanoma appears to be approximately equal in both sexes. Women with the tumor are more likely to survive long periods of time than are affected men. With cutaneous melanomas and ocular growths, the five-year survival rate is about 34 per cent in females and 23 per cent in males. Beyond the five-year period, the prognosis is more favorable in women.

The prognosis for five-year survival in both sexes decreases with advancing age out of proportion to the expected decrease in life expectancy with aging in the general population.

The effect that pregnancy has on survival is unknown. Some data suggest that gestation affects the prognosis adversely. Among women, survival rates are lowest at ages 40 to 50 years, a time of hormonal upheaval at menopause.

The likelihood of a hormonal influence on the growth of melanoma is suggested by the different prognosis in males and females, the increasingly poor prognosis with advancing age, the benignity in young children and, the possible effect of pregnancy.

The nature of the hormone influence remains obscure. Castration of men

(*Continued on page* 194)

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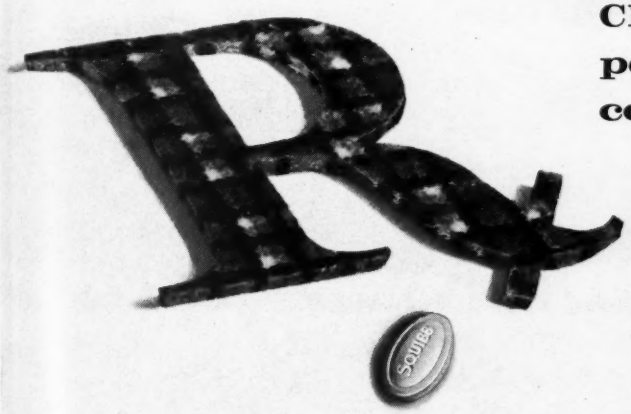

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ORAL DIAGNOSTIC SIGNS has been prepared by Edward J. Ryan, D.D.S., Editor of Dental Digest, and E. Cheraskin, M.D., D.M.D., Professor of Oral Medicine, University of Alabama.

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2. Physical Agents
3. Chemical Agents
4. Neoplasms
5. Cysts
6. Hormonal Disturbances
7. Developmental Disturbances
8. Nutritional Disturbances
9. Reactions to Stress and Antigentic Substances
10. Miscellaneous Disorders

CLINICAL AND LABORATORY SUGGESTIONS

(*See page* 186 *and* 187)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

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_____

Subject: _____

Explanation of Procedure:

Sketch:

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with melanoma does not produce improvement. Estrogen administration, adrenalectomy, and hypophysectomy have no effect on the course of metastatic melanoma. Interruption of pregnancy does not improve survival of women pregnant during the course of melanoma.

Sex hormones probably do not have a significant effect on the genesis of the tumor. Sex hormones may, however, affect the environment of the metastasis. The hormone influence is likely one of inhibiting, rather than preventing metastasis.

Apparently, melanoma is not the most malignant of all tumors in human beings. The prognosis appears to be far better with this tumor than with carcinoma of the stomach or lung.

White, Laurens P.: Studies on Melanoma, New England J. Med. **260**: 789-797 (March 15) 1959.

Schizophrenia

Usually schizophrenia is preceded by an obvious personality disorder of variable duration. If early signs of mental deterioration are recognized, frank psychosis may be prevented by judicious therapy and chloropromazine treatment. The stigma of insanity, loss of employment, and disruption of home life may be averted.

Schizophrenia develops only in persons of introvert personality. Introversion, however, does not always lead to schizophrenia. Features of introversion are sensitivity, subjectivity, active fantasy, idealism, and a need of privacy. Changes toward schizophrenia can be recognized in the affect, thought, and behavior of introverted persons.

The precursor of schizophrenic apathy is increasing withdrawal. For shy, sensitive persons, withdrawal is a protection against imagined insults and disturbing emotional experiences. Overuse of this defense leads to isolation, both physical and emotional, from the environment.

Anxiety without apparent cause may stem from a sense of impending personality disintegration or arising

homosexual conflicts. Prepsychotic schizophrenics spontaneously project feelings of disintegration while painting or modeling in clay. A disharmony is expressed even when a reasonable social adjustment is being made.

Euphoria and melancholy are significant. Slight persistent depression is common among introverts. A gradual change to a happier disposition may be a sign of developing maturation. Sudden alteration toward euphoria, however, associated with increasing introversion may signify onset of manic schizophrenia. When the change in mood is toward melancholy, self-depreciation may lead to erroneous diagnosis of depressive psychosis.

Introverts often have fleeting suspicions that other people are looking at them or talking about them. With the transition to prepsychotic schizophrenia, the suspicions cannot be dismissed and influence behavior. Idealistic motives are often expressed by both young introverts and prepsychotic patients.

An unusual preoccupation with birth and death may be a manifestation of the prepsychotic state. Often prepsychotic schizophrenics suddenly change religious convictions or political beliefs. A greater tendency to isolation, disregard of personal appearance, inability to concentrate, and overt masturbation demand immediate investigation. Sudden apparent extroversion in an introvert is not a healthy sign. Such an alteration may represent impairment of judgment.

Meares, Ainslie: The Diagnosis of Prepsychotic Schizophrenia, Lancet 1:55-58 (January) 1959.

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Hypnosis

The interest in hypnosis is increasing in several fields including medicine. Hypnosis is being used as a tool in therapy. This may take the form of symptomatic treatment, which is all that can be done under certain circumstances.

The process of psychoanalysis is speeded up by hypnoanalysis. In the hypnotic state the unconscious resistances are less and more easily overcome. Some believe that hypnosis is useful in diagnosis. The hypnotic patient can be probed more deeply because his resistances are less than in the nonhypnotized state.

Another use of hypnosis is as a method of preventing or at least alleviating certain undesirable conditions attendant upon some medical procedures and as side effects of diseases. These undesirable conditions are usually in the nature of fear, tension, anxiety, and loss of morale. Obstetrics is one area in this category. Hypnosis is used to teach the preparturient women relaxation. In some cases it may be used as an anesthetic. It is not practical to substitute hypnotic anesthesia for chemicals except in a few special cases. With proper psychologic preparation, the patient will develop a satisfactory level of anesthesia with less drug than if this preparation is neglected. This preanesthesia training can be quickly accomplished in most patients by the hypnotic technique and

(*Continued on page* 196)

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thus the danger from the use of the drug is decreased.

Another use of hypnosis is in the prevention and treatment of the "dumping syndrome" after a gastrectomy. Another profitable use is that in maintaining the morale of patients with long chronic illnesses so that they are more comfortable and a lessened burden to those who care for them.

Children starting at the age of 5 or 6 and going on through the teens are usually excellent hypnotic subjects. It is possible that a general and skillful use of hypnosis with these young people would prevent many of the neurotic forms of behavior so prevalent in our culture. There is no quicker way of implanting ideas than by suggestion while the subject is in the hypnotic state.

Some patients will be helped more than others. This is partly because some patients can assume the receptive attitude of hypnosis better than others. Some persons who are not good hypnotic subjects at the beginning will become better with practice. Only about 20 per cent of the normal population above the teen ages can go into deep hypnosis quickly and easily.

Hypnosis is not itself a therapeutic agent. It is a tool which often makes the accomplishment of certain ends easier for both the physician and the patient.

Heron, William T.: The Psychology of Hypnosis, General Practice **20**:92-101 (September) 1959.

Gout

The amount of uric acid in the body is determined largely by the rate of formation of purines from their precursors—simple carbon and nitrogen compounds, such as ammonia, carbon dioxide, glycine. The ingestion of preformed purines also contributes to the amount of uric acid.

These observations on the one hand explain why severe restrictions of purine intake fails to prevent attacks of gout and on the other hand they make it clear that total caloric intake is more important in the prevention of attacks than the amount of purine-rich food (liver, sweet-breads) in the diet. Probably the ingestion of small or moderate amounts of purine-rich foods can have little effect on the course of gout. More than 50 per cent of patients with clinical gout are obese. Overeating favors the development of both syndromes.

Another factor determining the amount of uric acid in the body is the rate of excretion of that substance. Gouty persons excrete normal or increased amounts of uric acid. They may form uric-acid stones in the genitourinary tract. All the uric acid in the blood is filtrable. It is removed, therefore, as the blood passes through the renal glomeruli. About 90 to 95 per cent of the filtered urate is reabsorbed, presumably in the proximal convoluted tubules. The urate clearance is normal in gout. The increased excretion of uric acid that may occur in gout is due to increased production of uric acid.

The primary defect in gout is a hereditarily determined overproduction of uric acid from its precursors in the metabolic pool. This rate of production cannot be lowered. The amount of miscible uric acid in the body is normally around 1.0 to 1.2 grams. In gout it is at least 3.0 grams and as much as 15.0 grams. In addition, there is an immiscible pool consisting of gouty deposits.

The filtration of uric acid in the renal glomeruli is maximal and cannot be increased. The only factor at present that can be influenced in the treatment of gout is the rate of tubular reabsorption of urate. This is the basis of the current treatment of the disorder. Several substances are known to decrease tubular resorption, thereby influencing the clearing of uric acid from the blood stream.

Altschule, Mark D.: Metabolic Consideration in Gout, Med. Science **6**: 77-80 (July 10) 1959.

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These substantial finances of the Foundation are mentioned to demonstrate that a man of industry, vision, and honor—such as Mr. Kellogg—may be a preeminent success in the business world and from his fortune improve the lot of thousands of his fellow men.

The enemies of our social structure like to assert that capitalism is a way of the tooth and the claw, the law of the predator and the jungle, the rule of the ruthless and the oppression of the weak. The worldwide activities of the Kellogg Foundation give proof that the fruits of capitalism may be used with more of a heart and with far more efficiency than any system of state socialism.

Did you ever read a bureaucratic document or a government regulation that sounds like this: "The human element has been strong in the many programs assisted by the Foundation since 1930. Whether the programs have aided a small community or affected to a degree the welfare of a region or even a nation, we have, of necessity, 'bet on the man.' With traditional emphasis upon people, the Foundation has, in effect, wagered the amounts of its grants on men or women who have good ideas and show promise of ability to develop these ideas for the betterment of mankind.

"Looking back over three decades, we can recall many instances of outstanding leaders who, in areas of health, education, or agriculture, spearheaded the drive of people toward improved community living. These leaders had the new ideas, the penetrating analyses, the revealing insights. And with poetic justice, the wisdom, altruism, courage, and persistence which have brought the ideas to fruition have also carried many of these individuals to greater personal prominence . . .

"On men the Foundation is delighted to place its 'bets.' Actually, 'calculated risk' is a better term for, given men and women of marked qualities

(*Continued on page* 204)

how characterized should a characterized tooth be?

Two Tests

No characterized denture can be considered successful unless it passes the two tests of (1) being so realistic as to defy detection, and (2) being acceptable to the patient.

Requirements for Realism

Myerson's new AEsthetic Characterized anterior teeth in multi-fired porcelain are the result of twenty years of leadership and experience in effective characterization*. Hand fabricated with the utmost attention to *realistic* details, their characterization includes simulated fillings, decalcification areas, irregular incisals, neck stains, line stains, incisal stains on lowers, even "graduated" characterization that becomes heavier with darker shades.

Acceptability to the Patient

These effects are so skillfully incorporated into Myerson's AEsthetic Characterized teeth that dentures made with these teeth are most convincingly natural-looking and actually enhance the patient's appearance. For this reason, you will find that Myerson's AEsthetic Characterized teeth create ready acceptance for characterization even though a higher fee is usually involved.

*The first ready-made characterized tooth was developed by Myerson in 1940.

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Twenty rats, in groups of four, are used in this modification of the method described by Davies *et al.*[1] The pain stimulus is provided by a heated resistance wire placed near the rats' tails. Direct contact with the hot wire is prevented by a specially designed water-cooled tail rest. Observers record the time interval that animals take to respond (tail jerk) to the heat stimulus.

Untreated rats react within three to six seconds. Any prolongation of this reaction time in animals receiving test medication is an indication of analgesia.

The rattail heat technic is one of many tests used by Lilly scientists to study the analgesic properties of compounds such as Darvon®. This unique analgesic, discovered and synthesized in the Lilly Research Laboratories, is equal to codeine in analgesic action yet has fewer side-effects.

1. Davies, O. L., Raventos, J., and Walpole, A. L.: Brit. J. Pharmacol., 1:255, 1946.

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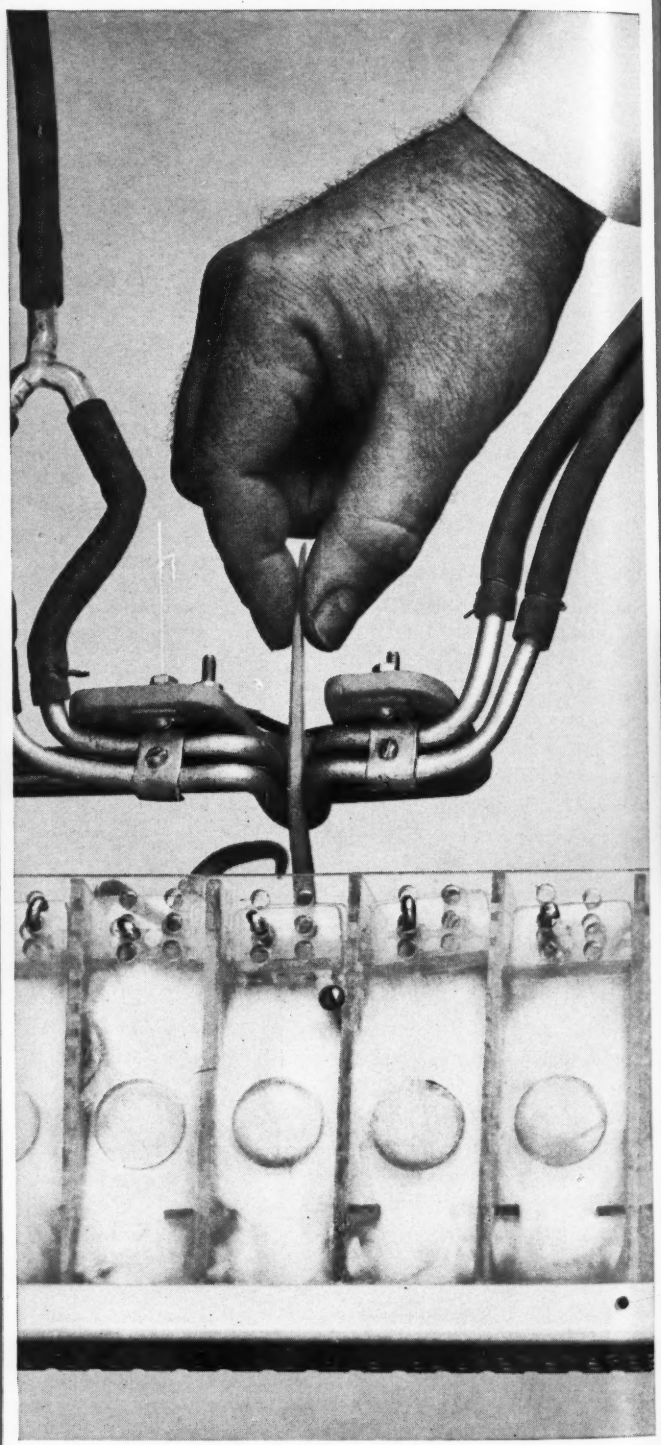

Rattail Heat Technic . . . valuable in preliminary screening of drugs for analgesic activity. Specially designed water-cooled tail rest prevents direct contact with hot wire.

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227 mg.	A.S.A.®	227 mg.
32.4 mg.	Caffeine	32.4 mg.

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Darvon Compound-65: 1 Pulvule three or four times daily.

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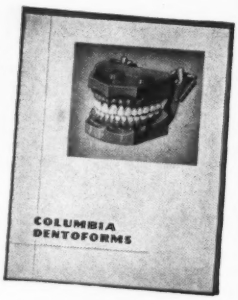

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and strengths proven in preceding efforts, some of the element of chance is eliminated from a new endeavor. And the Foundation bets on institutions, too. There are instances where a need is felt quite urgently or an idea is put forth spontaneously by a community or segment of the population. Often it is then that we look to a core of strength—for example to the people who comprise the administration and staff of an institution that in the past has demonstrated real capacity to develop ideas of people. An institution *is* people and reflects their vision, ingenuity, and integrity. The superior institution has the ability to attract outstanding individuals, to retain these leaders and keep them stimulated. It is only natural, therefore, that when a problem is made known to the Foundation, the agency chosen for an attempt to solve the problem is usually from among institutions which previously have shown ability to make optimum use of pioneering opportunities. This, in no way, precludes our cooperation with relatively new or less prominent institutions, for there are always rising stars on the health, education, or agricultural horizons and when the newcomers can attract good personnel, the kind of people needed to do the job, then the Foundation is glad to join with them on projects of real promise."

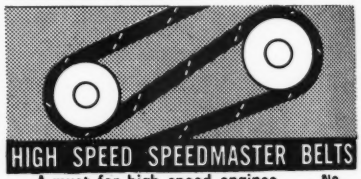
These are quotations from the 1960 report of the W. K. Kellogg Foundation.

The director of this vast, quarter-billion-dollar enterprise is a dentist, Emory W. Morris. The associate director is a dentist, Philip E. Blackerby. Both these men have "risen from the ranks" in the affairs of the Foundation. They are credits to the dental profession and eloquent proof that dentists have talents that are not circumscribed by the four walls of a dental office. Unfortunately, few dentists use their latent talents to this extent to expand their field of usefulness and opportunity.

Although both Emory Morris and Phil Blackerby have come to their present top executive rank from their beginning in the dental activities of the Foundation they have neither lost their interest in dentistry nor let their interest overshadow the other affairs of the Foundation.

The W. K. Kellogg Foundation granted $280,000 to the American Council on Education to help conduct the Survey of Dentistry (mentioned in this column last month). The Foundation's report on this Survey gives additional information on this important subject: "The key man in any effort to extend dental care to all the people will always be the general practitioner. If dental care is to be widely expanded, participation by individual dentists in Public Health and Preventive Dentistry must be intensively developed. Only about one-third of America's practitioners participate in school dental health programs and only about 40 per cent in educational campaigns for community fluoridation. Perhaps half of our dentists carry on moderately effective preventive programs including routine cleaning of the teeth, topical fluoride applications, X-ray examinations, periodic diagnostic examinations of patients, and laboratory tests of saliva as a basis for control of dental caries activity. The Survey recommends that dentists put more emphasis upon the preventive aspects of dental practice and further educate their patients in the importance of personal dental health.

"The preventive approach in itself, however, cannot be expected as yet to solve the dental manpower problem. More dentist's working time must be saved in other ways. To increase the productivity of the dentist, there are two ways that commend themselves particularly to the Commission. These are the establishment of group practices and the wider utilization of auxiliary personnel — dental assistants, hygienists, and laboratory technicians. The Commission recommends studies designed to develop and expand the duties of auxiliary personnel and expresses the belief that the broadening of auxiliary services should begin with dental hygienists because there already is an approved program of education and licensure for this group. Consideration should also be given, according to the Commission, to ex-



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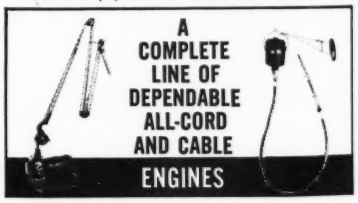

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panding the duties of dental laboratory technicians and dental assistants but this only after the educational programs for such personnel are standardized. The expansion of their duties needs to be carried out under the direction of the dental profession and the services performed must be under the supervision of dentists. The many practical and legal problems with respect to dental auxiliaries are discussed at considerable length in the Survey reports."

The muckrakers who have written in gall of the works of some of the great Funds and Foundations would find it virtually impossible to report anything less than laudatory of the W. K. Kellogg Foundation.

On Another Note

Not all activities of human beings are as commendable as the efforts of the Kellogg Foundation.

On the day that I received an anonymous "hate" letter because God was mentioned in an ORAL HYGIENE article a synagogue was bombed in Chicago. These are both the works of bigots in the U. S. A.—1961.

When we prate to the world about our superior culture how do we explain the hate mongers, the dope peddlers, the rapists, the thieves, and murderers who are featured every day in our newspapers? They are as much a part of our social structure as are free elections, freedom of speech, assembly, and worship.

We do not usually expect to receive an ethical message from Singapore. The *Christopher Notes* reports: "A listing of the 'seven deadly sins' of modern society, as published in the magazine 'Social Welfare' for Malayan youth in Singapore, shows that never-ending efforts are needed to overcome the tendency to take the easy way out.

"1. Politics without principle.
"2. Pleasure without conscience.
"3. Knowledge without work.
"4. Wealth without work.
"5. Business without morality.
"6. Science without humanity.
"7. Worship without sacrifice."

The importance of contact areas

Mesio-distal sections through portions of two bicuspids are used in the drawings to illustrate contact areas and the form of interproximal spaces under certain conditions. The first three drawings illustrate undesirable situations that can cause trouble. The fourth drawing illustrates the ideal type of contact and interproximal space for healthy function.

In Fig. A of the mesio-distal section, for example, the contact is too broad in the occluso-gingival dimension, and stringy foods are apt to be caught and held.

In Fig. B the contact is too far to the gingival. This creates a wedge-shaped occlusal embrasure, into which food is packed. The force created destroys the alignment of the teeth damaging the gingival tissues.

Fig. C shows a contact too close to the occlusal. Such a contact does not provide the sluice-way effect so necessary for tissue stimulation and for self-cleansing action.

Fig. D represents the ideal point of contact forming the correct interproximal space. *The J. M. Ney Company, Hartford 1, Connecticut.*

FIG. A: Contact too broad occluso-gingivally.

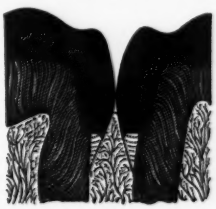

FIG. B: Contact too far to gingival

FIG. C: Contact too close to occlusal

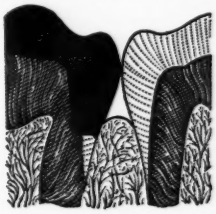

FIG. D: Contact normal

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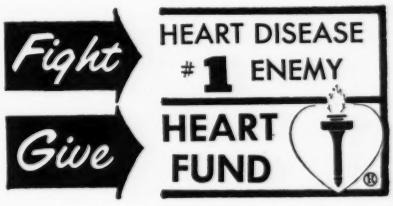

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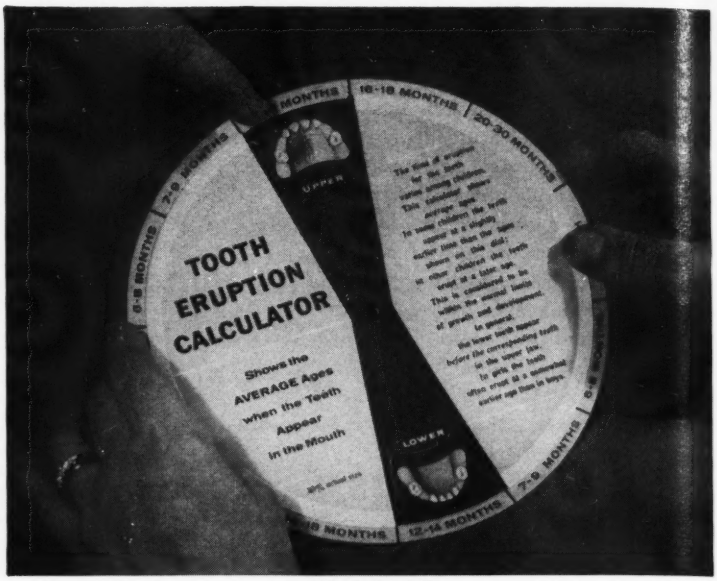

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Dental Surgery During Continuous Anticoagulant Therapy

(*Continued from page* 182)

raw surfaces should not be left exposed. Without sutures, poor clot formation creates an oozing gelatinous mass which increases in size and spreads the soft tissues apart. This exposes more oozing surface, engorges the tissues and makes them friable. Sutures placed during an eposide of postoperative hemorrhage are never as valuable as those which should have been placed when the surgery was performed.

Adapted from *Journal of the American Medical Association* **175**:483 (Feb. 11) 1961.

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